SCHEME OF EXAMINATION FOR B.Sc. (BOTANY) SEMESTER SYSTEM
w.e.f. Session 2016-17
Scheme of B.Sc. 1st Year

Semester I					
Sr. No.	**Paper code**	**Nomenclature**	**Marks+IA**	**Periods / week**	**Exam. Duration**
1.	BOT.1.1	Diversity of Microbes	40+10	4	3 hrs.
2.	BOT 1.2	Cell Biology	40+10	4	3 hrs.
3.	P-101	Practical (1.1& 1.2)	50	8	3hrs
Semester II					
4.	BOT 2.1	Diversity of Archegoniates	40+10	4	3 hrs.
5.	BOT 2.2	Genetics	40+10	4	3 hrs.
6.	P-102	Practical (2.1& 2.2)	50	8	3 hrs
Total Semester I & II			**300**		

Scheme of B.Sc. II (2017-18)

Semester III					
Sr. No.	**Paper code**	**Nomenclature**	**Marks+IA**	**Periods / week**	**Exam. Duration**
1.	BOT 3.1	Biology and Diversity of Seed Plants-I	40+10	4	3 hrs.
2.	BOT 3.2	Plant Anatomy	40+10	4	3 hrs.
3.	P-201	Practical (3.1& 3.2)	50	8	3 hrs
Semester IV					
4.	BOT 4.1	Biology and Diversity of Seed Plants II	40+10	4	3 hrs.
5.	BOT 4.2	Plant Embryology	40+10	4	3 hrs.
6.	P-202	Practical (4.1& 4.2)	50	8	3hrs
Total Semester III & IV			**300**		

Scheme of B.Sc. III (2018-19)

Semester V					
Sr. No.	**Paper code**	**Nomenclature**	**Marks+IA**	**Periods / week**	**Exam. Duration**
1.	BOT 5.1	Plant Physiology	40+10	4	3 hrs.
2.	BOT 5.2	Ecology	40+10	4	3 hrs.
3.	P-301	Practical (5.1& 5.2)	50	8	3hrs
Semester VI					
4.	BOT 6.1	Biochemistry & Plant Biotechnology	40+10	4	3 hrs.
5.	BOT 6.2	Economic Botany	40+10	4	3 hrs.
6.	P-302	Practical (6.1& 6.2)	50	8	3hrs
Total Semester V & VI			**300**		
Grand Total Semester I – VI			**900**		

Note: -

- There will be an internal assessment of 20%, in each theory paper.
- I Period =45 minutes
- Practical examination will be held conducted at the end of each semester.

B.Sc. Botany

SEMESTER-I

PAPER CODE: BOT. 1.1

PAPER –I DIVERSITY OF MICROBES

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question No. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Bacteria: Structure, nutrition, reproduction and economic importance **Cyanobacteria**: General characters; life-history of *Nostoc*

Algae: General characters, classification (upto classes) and economic importance; General account of algal blooms

UNIT II

Important features and life-history (excluding development) of *Volvox*, *Oedogonium* (Chlorophyceae), *Vaucheria* (Xanthophyceae), *Ectocarpus* (Phaeophyceae) and *Polysiphonia* (Rhodophyceae)

UNIT-III

Viruses: General account of Viruses including structure of TMV and Bacteriophages

Fungi: General characters, classification (upto classes) and economic importance; General account of Lichens

UNIT- IV

Important features and life-history of *Phytophthora* (Mastigomycotina), *Mucor* (Zygomycotina), *Penicillium* (Ascomycotina), *Puccinia*, *Agaricus* (Basidiomycotina), *Colletotrichum* (Deuteromycotina)

B.Sc. Botany

SEMESTER-I

PAPER CODE: BOT. 1.2

PAPER –II CELL BIOLOGY

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question no. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

The Cell Envelopes: Structure and functions of Cell Wall, Plasma Membrane, Golgi Apparatus, Endoplasmic Reticulum, Lysosomes, Peroxisomes and Vacuoles

UNIT II

Ultra-structure and function: Chloroplast, Mitochondria, Nucleus and Nucleolus

Chromosome: Morphology, ultra-structure - kinetochore, centromere and telomere

UNIT-III

Cell Cycle: General account

Cell Division: Mitosis and Meiosis - Stages and Significance

UNIT - IV

Chromosomal aberrations: Structural and Numerical - deletions, duplications, translocations, inversions, aneuploidy, polyploidy

Sex chromosomes and Sex determination in Plants

PRACTICALS
B.Sc. 1st Botany (First Semester)

Diversity of Microbes and Cell Biology (Code: P 101)

Max. Marks: 50 Time allotted: 3 Hours

1. Identify, classify and write short morphological notes giving well labelled relevant diagrams on the given two specimens A, B & C (15)

2 Prepare smear/squash and find out two different stages of mitosis/meiosis. Identify and show it to the examiners and also give characters of identification. (12)

3 Identify giving two important characters of identification of the given spots 1, 2, 3,4
(one slide/ material from virus, bacteria, fungi, lichen). (8)

4. Field visit and collection records (5)

5. Practical records (5)

6. Viva-voce (5)

SUGGESTED READINGS

Smith, G.M. 1971. Cryptogamic Botany. Vol.I. Algae & Fungi. Tata McGraw Hill Publishing Co., New Delhi.

Sharma, P.D. 1991. The Fungi. Rastogi & Co., Meerut.

Dube, H.C. 1990. An Introduction to Fungi, Vikas Publishing House Pvt.Ltd., Delhi.

Clifton, A. 1958. Introduction to the Bacteria: McGraw Hill & Co., New York.

Alberts, B.Bray, D.Lewis, J., Raff, M.., Roberts, K. and Watson. I.D. 1999. Molecular Biology of Cell. Garland Publishing Co., Inc., New York, USA.

Atherly, A.G. Girton, J.R. and McDonald, J.F. 1999. The Science of Genetics, Saunders College Publising , Fort Worth, USA.

Gupta, P.K. 1999. A text book of Cell and Molelcular Biology. Rastogi Publications, Meerut, India.

B.Sc. Botany
Semester-II

PAPER CODE: BOT. 2.1

PAPER –I DIVERSITY OF ARCHEGONIATES

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit. Question No. 1 is compulsory (short answer type).Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Bryophyta- General characters, classification (upto classes), alternation of generations, evolution of sporophytes and economic importance

UNIT -II

Bryophyta: Structure and reproduction (excluding development) of *Marchantia* (Hepaticopsida), *Anthoceros* (Anthocerotopsida) and *Funaria* (Bryopsida)

UNIT-III

Pteridophyta- General characters, classification (upto classes), alternation of generations, heterospory, apospory, apogamy and economic importance;
General account of stellar evolution

UNIT IV

Pteridophyta: Structure and reproduction (excluding development) of *Rhynia* (Psilopsida), *Selaginella* (Lycopsida), *Equisetum* (Sphenopsida) and *Pteris* (Pteropsida)

B.Sc. Botany
SEMESTER-II
PAPER CODE: BOT. 2.2
PAPER –II GENETICS

Internal Assessment-10
Max. Marks – 40
Time- 3 Hours

Note: Attempt five questions in all, selecting one question from each unit.
Question no. 1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Genetic Material: DNA - the genetic material, DNA structure and replication, DNA-Protein interaction, The Nucleosome Model, Genetic Code, Satellite and Repetitive DNA.

UNIT - II

Genetic Inheritance: Mendelism: Laws of Segregation and Independent Assortment; Linkage Analysis; Allelic and non-allelic interactions.

UNIT-III

Extra-nuclear Inheritance: Presence and function of Mitochondrial and Plastid DNA; Plasmids.

Genetic Variations: Mutations - spontaneous and induced; transposable genetic elements; DNA damage and repair.

UNIT - IV

Gene Expression: Modern concept of gene; RNA; Ribosomes; Transfer of genetic information - transcription and translation; Structure of proteins; Regulation of gene expression in prokaryotes and eukaryotes

PRACTICALS

B.Sc. 1st Botany (Second Semester)

Diversity of Archegoniates and Genetics

(Code: P-201)

Max Marks: 50 **Time: 3hrs**

1. Identify, classify and write short morphological notes giving well labelled diagrams on the given two specimens from Bryophytes and Pteridophytes. (12)

2. One numerical regarding genetics (Mendelian inheritance or gene interaction) as per syllabus. (12)

3. Identify giving two important characters of identification of the given spots 1, 2, 3,4 (8)

4. Field Visit and collection records (8)

5. Practical records (5)

6. Viva-voce (5)

SUGGESTED READINGS:

Atherly, A.g. Girton, J.R. and McDonald, J.F. 1999. The Science of Genetics, Saunders College Publishing, Fort Worth, USA.

Gupta, P.K. 1999. A text book of Cell and Molecular Biology. Rastogi Publications, Meerut, India

Kleinsmith, L.J. and Kish, V.M. 1995. Principles of Cell and Molelcular Biology (2nd edition). Harper Collins College Publishers, New York, USA.

Lodish, H., Berk, A., Zipursky, S.L., Matudaria, P., Baltimoe, D. and Darnell, J. 2000. Molecular, Cell Biology, W.H. Freeman and Co., New York, USA.

Russel, P.J. 1998. Genetics, The Benjamin/Cummings Publishing Co. Inc., USA.

Snustad, D.P. and Simmons, M.J. 2000. Principles of Genetics. John Wiley and Sons, Inc. USA.

Smith, G.M. 1971. Cryptogamic Botany, Vol.II, Bryophytes & Pteridophytes. Tata McGraw Hill Publishing Co., New Delhi.

Sharma, O.P. 1992. Text Book of Thallophytes, McGraw Hill Publishing Co.

Sharma, O.P. 1990. Text Book of Pteridophyta, Mc Millan India Ltd.

Puri, P., 1980, Bryophyta, Atma Ram & Sons, Delhi.

Russel, P.J. 1998. Genetics, The Benjamin/Cummings Publishing Co. Inc., USA.

Snustad, D.P. and Simmons, M.J. 2000. Principles of Genetics. John Wiley and Sons, Inc. USA.

B.Sc. Botany
SEMESTER-III
PAPER CODE: BOT. 3.1

Paper -I BIOLOGY AND DIVERSITY OF SEED PLANTS –I

Internal Assessment-10
Max. Marks - 40
Time – 3 hrs.

Note : Attempt five questions in all, selecting one question from each unit. Question No.1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

General characters, origin and evolution ofGymnosperms
Geological Time Table; Evolution of Seed Habit.
Pilger and Melchior's (1954) system of classification of Gymnosperms.

UNIT-II

Palaeobotany- Fossils and Fossilization (Process involved, types of fossils and importance of fossils);
Reconstruction of the following fossil plants:

Lyginopteris
Williamsonia
Cycadeoidea (= Bennettites)

UNIT-III

Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of following plants:
Cycas
Pinus

UNIT-IV

Morphology and anatomy of root, stem, leaf/leaflet and reproductive parts including mode of reproduction, life-cycle and economic importance of *Ephedra*
Economic importance of Gymnosperms
General characters, origin and evolution of Angiosperms

B.Sc. Botany
SEMESTER-III
PAPER CODE: BOT. 3.2
PAPER-II PLANT ANATOMY

Internal Assessment-10
Max. Marks - 40
Time – 3 hrs.

Note : Attempt five questions in all, selecting one question from each unit. Question No.1 is compulsory (short answer type).
Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Tissues - meristematic and permanent (simple, complex and secretory) Tissue systems (Epidermal, ground and vascular)
The Shoot system - shoot apical meristem and its histological organizations.

UNIT-II

Cambium - structure and functions.
Secondary growth in dicot stem; characteristics of growth rings; sap wood and heart wood, periderm;
Anomalous secondary growth (*Dracaena, Boerhaavia* and *Achyranthes*)

UNIT-III

Leaf: Types of leaves (simple and compound); phyllotaxy. Epidermis-uniseriate and ultiseriate, epidermal appendages and their morphological types.
Anatomy of typical Monocot and Dicot leaf and cell inclusions in leaves, leaf abscission, Stomatal apparatus and their morphological types

UNIT-IV

Root system: Root apical meristem; histological organization
Secondary growth in dicot root.
Structural modifications in roots: Storage (*Beta*), Respiratory (*Rhizophora*), Epiphytic (*Vanda*).

PRACTICALS

B.Sc. IInd Botany (Third Semester)

Biology & Diversity of Seed Plants-I and Plant Anatomy(Code: P 301)

Max. Marks: 50 **Time : 3Hours**

1. Cut the section of given material A and prepare a double-stained permanent mount of the given material. Identify giving reasons and show it to the examiner. (10)

2 Identify, classify and write morphological notes on the given material/specimens B & C from Gymnosperms. (10)

3 Identify, giving the important characters of identification of the spots/specimen 1 and 2 from Gymnosperms and 3 and 4 from angiosperms (10)

4 Filed visit and collection records. (10)

5 Note-book (5)

6 Viva-voce (5)

Suggested Readings

Bhatnagar, S. and Moitra, A. 1996. Gymnosperms. New Age International Limited, New Delhi.

Davis, P.H. and Heywood, V.H. 1963. Principles of Angiosperms Taxonomy, Oliver and Boyd. London.

Gifford, E.M. and Foster, A.S. 1988. Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.

Heywood, V.H. and Moore, D.M. (eds) 1984. Current concepts in Plant Taxonomy. Academic Press, London.

Jeffrey, C. 1982. An introduction to Plant Taxonomy. Cambridge University Press, Cambridge, London.

Jones, S.B. , Jr. Luchsinger, A.E. 1986. Plants Systematics 2nd edition). McGraw Hill Book Co. New York.

Maheshwari, J.K. 1963. Flora of Delhi, CSIR, New Delhi.

Radford, A.E. 1986. Fundamentals of Plant Systamtics. Harper and Row, New York.

Singh, G. 1999. Plant Systematics: Theory and Practical. Oxford and IBH Pvt. Ltd., New Delhi.

Sporn, K.R. 1965. The Morphology of Gymnsperms. Hutchinson & Co. Ltd., London.

Stace, C.A. 1989. Plant Taxonomy and Biosystematics (2nd edition). Edward Arnold, London.

Steward, W.M. Paleobotany and the Evolution of Plants. Cambridge University Press, Cambridge.

B.Sc. Botany

SEMESTER- IV

PAPER CODE: BOT. 4.1

PAPER-I BIOLOGY AND DIVERSITY OF SEED PLANTS-II

Internal Assessment-10

Max. Marks - 40

Time – 3 hrs

Note: Attempt five questions in all, selecting one question from each unit. Question No.1 is compulsory (short answer type).Nine questions are to be set spread over the entire syllabus. All questions carry equal marks

UNIT-I

Taxonomy and Systematics, fundamental components of taxonomy (identification, classification, description, nomenclature and phylogeny), Role of chemotaxonomy, cytotaxonomy and taximetrics in relation to taxonomy, Botanical Nomenclature, principles and rules, principle of priority, Keys to identification of plants.

UNIT-II

Type concept, taxonomic ranks, Salient features of the systems of classification of angiosperms proposed by Bentham & Hooker and Engler & Prantl, Floral Terms and Types of Inflorescence

UNIT-III

Diversity of Flowering Plants: Diagnostic features and economic importance of the following families: Ranunculaceae, Brassicaceae, Malvaceae, Euphorbiaceae, Rutaceae, Fabaceae, Cucurbitaceae

UNIT-IV

Diversity of Flowering Plants: Diagnostic features and economic importance of the families: Apiaceae, Asclepiadaceae, Lamiaceae, Solanaceae, Asteraceae, Liliaceae and Poaceae

B.Sc. Botany

SEMESTER- IV

PAPER CODE: BOT. 4.2

PAPER-II PLANT EMBRYOLOGY

Internal Assessment-

10 Max. Marks - 40

Time – 3 hrs.

Note : Attempt five questions in all, selecting two questions from each unit. Question No.1 is compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Flower-a modified shoot, Microsporangium, its wall and dehiscence mechanism.

Microsporogenesis, pollen grains and its structure (pollen wall).

UNIT -II

Pollen germination (microgametogenesis), Male gametophyte, Pollen-pistil interaction; self incompatibility, Pollination: types and agencies

UNIT-III

Structure of Megasporangium (ovule), its curvatures; Megasporogenesis and Megagametogenesis,Female gametophyte (mono, bi and tetrasporic), Double fertilization,Endosperm types and its biological importance.

UNIT-IV

Embryogenesis in Dicot and Monocot; Polyembryony, Structure of Dicot and Monocot seed, Fruit types; Dispersal mechanisms in fruits and seeds.

PRACTICALS

B.Sc. IInd Botany (Fourth Semester)

Max. Marks: 50 Time: 3Hours

1 Describe/compare the given flowers A and B in semi-technical language giving V.S. of flowers, T.S. of ovaries, floral diagrams and Floral Formulae. Identify and assign them to their respective families giving reasons. (12)

2 Dissect out the globular/heart-shaped embryo from the given material. (10)

3 Identify, giving the important characters of identification of the spots 1, 2 and 3 from embryology (9)

4 Field visit and collection records. (9)

5 Practical records (5)

6 Viva-voce (5)

Suggested Readings

Bhojwani, S.S. and Bhatnagar, S.P. 2000. The Embryology of Angiosperms. 4th revised and enlarge edition. Vikas Publishing House, Delhi.

Cutter, E.G. 1969. Plant Anatomy Part-I, Cells and Tissues, Edward Arnold, London.

Cutter, E.G. 1971. Plant Anatomy: Experiment and Interpretation. Part-II Organs, Edward Arnold London.

Esau, K. 1977. Anatomy of Seed Plants, 2nd edition. John Wiley & Sons, New York.

Fageri, K and Van der Pijl 1979. The Principles of Pollination Ecology. Pergamon Press, Oxford.

Fahn, A. 1974. Plant Anatomy, 2nd Edition. Pergamon Press, Oxford.

Hartmann, H.T. and Kestler, D.E. 1976. Plant Propagation; Principles and Practices. 3rd edition. Prentice Hall of India Pvt. Ltd. New Delhi

King. J. 1997. Reaching for the Sun: How Plants Works. Cambridge University Press, Cambridge, U.K.

Mauseth, J.D. 1988. Plant Anatomy. The Benjamin/Cummings Publishing Company Inc. Menlo Park, California, USA.

Proctor, M and Yeo, P. 1973. The Pollination of Flowers. William Collins Sons, London.

Raven, P.H. Evert, R.F. and Eichhorn, S.E. 1999. Biology of Plants. 5th edition. W.R. Freeman and Co., Worth Publishers, New York.

Thomas, P. 2000. Trees: Their Natural History. Cambridge University Press, Cambridge.

B. Sc. III (Botany) Syllabus

PAPER CODE: BOT. 5.1

SEMESTER-V

Paper – I Plant Physiology

Internal Assessment-
10 Max. Marks – 40
Time – 3 hrs.

Note: Five questions to be attempted in all, selecting one question from each unit.
Question No. 1 will be compulsory (short answer type).
Nine questions are to be set spread over the entire
syllabus. All questions carry equal marks.

UNIT-I

Plant-water relations: Importance of water to plant life; physical properties of water; imbibition, diffusion and osmosis; absorption and transport of water; transpiration; physiology of stomata.

Mineral nutrition: Essential macro and micro elements and their role; mineral uptake; deficiency symptoms.

UNIT -II

Transport of organic substances: Mechanism of phloem transport; source-sink relationship; factors affecting translocation.

Photosynthesis : significance; historical aspects; photosynthetic pigments; action spectra and enhancement effects; concept of two photosystems; Z-scheme; photo-phosphorylation; Calvin cycle; C4 pathway; CAM plants; photorespiration.

UNIT-III

Growth and development : Definitions; phases of growth and development; seed dormancy; plant movements; the concept of photoperiodism; physiology of flowering; florigen concept; physiology of senescence; fruit ripening;

UNIT -IV

Plant hormones- auxins, gibberellins, cytokinins, abscissic acid and ethylene, history of their discovery, mechanism of action; photo-morphogenesis;

Phytochromes and their discovery, physiological role and mechanism of action.

Suggseted Readings:

1. Dennis,D.T., Turpin, D.H., Lefebvre,D.D. and Layzell (eds.). 1997: Plant Metabolism (2nd Edition), Longman, Essex, England.
2. Galston, A.W. 1989: Life Processes in Plants, Scientific American Library, Springer-Verlag, New York, USA.
3. Hopkins, W.G., 1995: Introduction to Plant Physiology, John Wiley & Sons, Inc., New York, USA.
4. Mohr, H. and Schopfer, P. 1995: Plant Physiology. Springer-Verlag, Berlin Germany.

B. Sc. III (Botany) Syllabus
SEMESTER-V

PAPER CODE: BOT. 5.2

Paper - II Ecology

Internal Assessment-10
Max. Marks – 40
Time – 3 hrs.

Note: Five questions to be attempted in all, selecting two questions from each unit. Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Introduction to Ecology: Definition; scope and importance; levels of organization . Environment: Introduction; environmental factors- climatic (water, humidity, wind, light, temperature), edaphic (soil profile, physico-chemical properties), topographic and biotic factors (species interaction).

UNIT-II

Adaptations of plants to water stress and salinity (morphological and anatomical features of hydrophytes, xerophytes and halophytes).

Population ecology: Basic concept; characteristics; biotic potential, growth curves; ecotypes and ecads.

UNIT-II

Community ecology: Concepts; characteristics (qualitative and quantitative analytical and synthetic); methods of analysis; ecological succession.

Ecosystem: Structure (components) and functions (trophic levels, food chains, food webs, ecological pyramids and energy flow)

Biogeochemical cycles: Carbon, nitrogen, phosphorus and hydrological cycle.

UNIT-IV

Phyto-geography: Phyto- geographical regions of India; vegetation types of India (forests). Environmental pollution: Sources, types and control of air and water pollution.

Global change: Greenhouse effect and greenhouse gases; impacts of global warming; carbon trading; Ozone layer depletion; Biomagnification

Suggested Readings:

1. Odum, E.P. 1983: Basic Ecology, Saunders, Philadelphia.
2. Kormondy, E.J. 1996: Concepts of Ecology, Prantice-Hall of India Pvt. Ltd., New Delhi.
3. Mackenzie, A. et al. 1999: Instant Notes in Ecology, Viva Books Pvt. Ltd., New Delhi.

Semester V

Practical

Plant Physiology and Ecology (P-501)

Max. Marks: 50 **Time: 3hrs.**

1. Devise an experiment to demonstrate the physiological process (As per list).Perform it and show it to the examiner.	12
2. Comment on physiological experiment (Specimen set up/ model/chart).	10
3. Ecological experiment/ecological specimen (As per list)	12
4. Note Book, Collection and field report	10
5. Viva-voce	6

B.Sc. Botany

SEMESTER-VI

PAPER CODE: BOT. 6.1

Paper – I Biochemistry and PlantBiotechnology

Internal Assessment-10

Max. Marks –40

Time – 3 hrs

Note: Five questions to be attempted in all, selecting two questions from each unit.

Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Basics of Enzymology: Discovery and nomenclature; characteristics of enzymes; concept of holoenzyme, apoenzyme, coenzyme and co-factors; regulation of enzyme activity; mechanism of action.

UNIT-II

Respiration: ATP – the biological energy currency; aerobic and anaerobic respiration; Krebs cycle; electron transport mechanism (chemiosmotic theory); redox -potential; oxidative phosphorylation; pentose phosphate pathway.

UNIT-III

Lipid metabolism: Structure and functions of lipids; fatty acid biosynthesis; β-oxidation; saturated and unsaturated fatty acids; storage and mobilization of fatty acids.

Nitrogen metabolism: Biology of nitrogen fixation; importance of nitrate reductase and its regulation; ammonium assimilation.

UNIT-IV

Genetic engineering and Biotechnology: Tools and techniques of recombinant DNA technology; cloning vectors; genomic and cDNA library; transposable elements; aspects of plant tissue culture; cellular totipotency, differentiation and morphogenesis; biology of *Agrobacterium*; vectors for gene delivery and marker genes.

Suggested Readings:

1. Bhojwani, S.S. 1990: Plant Tissue Culture Applications and Limitations. Elsevier Science Publishers, New York, USA.
2. Lea, P.J. and Leegood, R.C. 1999:Plant Biochemistry and Molecular Biology, John Wiley & Sons, Chichester, England.
3. Old, R.W. and Primrose, S.B. 1989: Principles of Gene Manipulation, Blackwell Scientific Publications, Oxford, UK.
4. Raghavan, V. 1986: Embryogenesis in Angiosperms: A Developmental and Experimental Study, Cambridge University Press, New York, USA.

SEMESTER-VI

PAPER CODE: BOT. 6.2

Paper – II Economic Botany

Internal Assessment-10

Max. Marks – 40 **Time – 3 hrs.**

Note: Five questions to be attempted in all, selecting two questions from each unit.

Question No. 1 will be compulsory (short answer type). Nine questions are to be set spread over the entire syllabus. All questions carry equal marks.

UNIT-I

Vavilov's centres of origin of crop plants, Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Food plants - cereals (rice, wheat and maize), pulses (gram, arhar and pea), vegetables (potato, tomatoand onion).

UNIT-II

Origin, distribution, botanical description, brief idea of cultivation and economic uses of the following:

Fibers- cotton, jute and flax.

Oils- groundnut, mustard, sunflower and coconut.

UNIT-III

Morphological description, brief idea of cultivation and economic uses of the following:

Spices- coriander, ferula, ginger, turmeric, cloves.

Medicinal plants- *Cinchona, Rauwolfia, Atropa, Opium, Cannabis, Azadirachta, Withania*.

UNIT-IV

Botanical description, processing and uses of:

Beverages- tea and coffee;

Rubber - *Hevea*;

Sugar- sugarcane

General account and sources of timber; energy plantations and bio-fuels.

Semester VI

Practical

Biochemistry, Biotechnology and Economic Botany (P-601)

Max. Marks: 50

Time: 3 hrs.

1. Device an experiment to test the carbohydrate/protein/fats/peroxidase activity. Perform it and show it to the examiner. 10

2. Perform /Comment on Biotechnological experiment (As per list). 12

3. Identify and classify spots1,2,3 & 4 from the point of view of economic important and morphology of the plant part used 12

4. Note Book, Collection and field report. 10

5. Viva-voce 6

Suggested Readings:

1. Kocchar, S.L. 1998: Economic Botany in Tropics, 2nd edition, MacMillan India Ltd., New Delhi.
2. Sambammurthy, A.V.S.S. And Subramanyam, N.S. 1989: A Textbook of Economic Botany, Wiley Eastern Ltd., New Delhi.
3. Sharma, O.P. 1996: Hills Economic Botany (Late Dr. A.F. Hill adapted by O.P. Sharma), Tata McGraw Hill Co. Ltd., New Delhi.
4. Simpson, B.B. and Conner-Ogorzaly, M. 1986: Economic Botany- Plants in Our World, McGraw Hill, New York

w.e.f. session 2020-21

Indira Gandhi University, Meerpur, (Rewari)

Examination Scheme and Syllabus

M.Sc. Geology

Choice Based Credit System

(Semester I to IV)

2020-21

Scheme of Examination

M.Sc. Geology
Choice Based Credit System
w.e.f. Session 2020-21

SEMESTER-I

Paper Code	Paper Name	Internal Marks	External Marks	Max Marks	Credits
GEOL-101	Geosciences-I	20	80	100	4
GEOL-102	Geosciences-II	20	80	100	4
GEOL-103	Mineralogy and Crystallography	20	80	100	4
GE0L-104	Igneous Petrology	20	80	100	4
GEOL-105	Structural Geology	20	80	100	4
GEOL-106	Practical based on GEOL-101 & GEOL-102 & GEOL-103	-	100	100	4
GEOL-107	Practical based on GEOL-104 & 105	-	100	100	4
GEOL-108	Geological Field Training-I	40	60	100	6
	Total	**140**	**660**	**800**	**34**

Note:

- Each theory paper will include 20% marks as internal assessment as per University rules.
- Each practical examination will be of 03 hours.
- Practical marks will include 10% marks for viva-voce and 10% for record files.
- Total Credits = 34

SEMESTER-II

Paper Code	Paper Title	Internal Marks	External Marks	Max Marks	Credits
GEOL-201	Geomorphology and Geotectonics	20	80	100	4
GEOL-202	Paleontology and Stratigraphy	20	80	100	4
GEOL-203	Metamorphic Petrology	20	80	100	4
GE0L-204 Or GEOL-205	Engineering Geology Climatology and Oceanography	20	80	100	4
GEOL-206	Practical based on GEOL-201 & GEOL-202	-	100	100	4
GEOL-207	Practical based on GEOL-203 & GEOL-204/GEOL-205	-	100	100	4
GEOL-OE-208	**To be chosen by students of other departments**	**20**	**80**	**100**	**3**
Foundation Elective	From the pool offered by University	20	80	100	2
	Total	**100**	**600**	**700**	**26**

Note:

- Each theory paper will include 20% marks as internal assessment as per University rules.
- Each practical examination will be of 03 hours.
- Practical marks will include 10% marks for viva-voce and 10% for record files.
- Total Credits = 26

SEMESTER III

Paper code	Paper Title	Internal Marks	External Marks	Max Marks	Credits
GEOL-301	Sedimentology and Fuel Geology	20	80	100	4
GEOL -302	Advanced Paleontology	20	80	100	4
GEOL -303	Ore Geology and Indian Mineral Resources	20	80	100	4
GEOL -304 Or GEOL-305	Mineral Exploration and Mining Geology SUMMER INTERNSHIP (ACADEMIC OR INDUSTRIAL)	20	80	100	4
GEOL -306	Practical based on GEOL-301 & GEOL-302	-	100	100	4
GEOL -307	Practical based on GEOL-303 & GEOL-304/GEOL-305	-	100	100	4
GEOL-308	Geological Field Training-II	40	60	100	6
GEOL-OE-309	**To be chosen by students of other departments**	**20**	**80**	**100**	**3**
OE	From the pool offered by University (Excluding the OEC offered by the Dept. of Geology)	20	80	100	3
	Total	**140**	**660**	**800**	**33**

Note:

- Each theory paper will include 20% marks as internal assessment as per University rules.
- Each practical examination will be of 03 hours.
- Practical marks will include 10% marks for viva-voce and 10% for record files.
- Total Credits = 33

SEMESTER-IV

Paper code	Paper Title	Internal Marks	External Marks	Max Marks	Credits
GEOL-401	Geochemistry	20	80	100	4
GEOL-402	Geohydrology	20	80	100	4
GEOL-403	Stratigraphy and Paleogeography	20	80	100	4
GEOL-404	Geophysical Prospecting and Instrumentation	20	80	100	4
GEOL-405 Or GEOL-406	Environmental Geology Or Remote Sensing & GIS	20	80	100	4
GEOL-407	Practical based on GEOL-401and GEOL-402	-	100	100	4
GEOL-408	Practical based on GEOL-403 & GEOL-405/GEOL-406	-	100	100	4
	Total	**100**	**600**	**700**	**28**

Note:

- Each theory paper will include 20% marks as internal assessment as per University rules.
- Each practical examination will be of 03 hours.
- Practical marks will include 10% marks for viva-voce and 10% for record files.
- Total Credits = 28

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **1st**
SUBJECT CODE: **GEOL-101**
COURSE TITLE: **GEOSCIENCES-I**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: OBJECTIVE: The course is intended to provide a holistic approach to study formation of Earth and its relationship with other planets of Solar system. This course includes the study of surficial features which are created by various agencies. The subject will serve as an account of the processes at planet's surface with the integrated approach of tectonic forces and the landforms developed on continent surface or on sea floor.
OUTCOME: Students will learn about origin and evolution of Planets in Solar System. This course will help the learner in the understanding the nature and behavior of Earth material. They can develop an understanding about the geomorphic and sedimentological processes related to fluvial, coastal, aeolian, and glacial regimes. Ocean floor morphology can be understood by explaining depth wise division of it.

Course Contents:

Unit No.	Contents
UNIT-I	Modern theories on the origin of the Earth and other planetary bodies. Kepler's laws of planetary motion, Physical parameters of Sun and Planets, Milankovitch cycles Evolution of Earth and it's atmosphere, Interior of Earth, elements of seismology – body and surface waves and their propagation, Earth's gravity and magnetic fields and its thermal structure, concept of Isostasy,
UNIT-II	Classification of rocks and concept of rock cycle, weathering, erosion, transportation and deposition of Earth's material; weathering products and soils, Soil: profile and types, Erosional transportation and depositional features of: wind, river, glacier and groundwater.
UNIT-III	Concept of Sea floor spreading, continental drift, Plate-tectonics and Wilson Cycle; Volcanoes, Earthquakes – their causes and measurement, Major landforms of Earth-Mountains, Plateaus, Plains and oceanic landforms, physiographic divisions of India, river basins in India
UNIT-IV	Hypsography of the continents and ocean floor –continental shelf, slope, rise and abyssal plains; Residence times of elements in sea water, Biological productivity in the oceans. Structure and composition of the atmosphere, Earth's radiation budget; greenhouse gases and effect. Cloud formation and precipitation processes, atmospheric pollution, ozone depletion

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Introduction to Planetary Science (The Geological Perspective) by Gunter Faure & Teresa M. Mensing
2. Understanding Earth. J. Grotzinger, H. Jordan, F. Press
3. Earth Materials. Kevin Hefferan and John O'Brien
4. Earth as an Evolving Planetary System Kent C. Condie
5. Lowrie, W. "Introduction to Geophysics"
6. Lillie, R.J. "Whole Earth Geophysics"
7. Fundamental Planetary Science. JACK J. LISSAUER
8. Introduction to Geomorphology by Vishwas S.Kale & Avijit Gupta.
9. Principal of Geomorphology by W.D. Thornbury
10. "Understanding the earth", W.H. Freeman & Co. Press, F. and Siever, R.,
11. "Physical Geology", Brooks-Cole. by Moore, J.S. and Wicander, R.,
12. "Essentials of Geology", John Wiley & Sons, by Marshak, S.
13. Lal, D. S. Oceanography, Sharada Pustak Mahal
14. The Solid Earth Cambridge University Press, New York, C.M.R. Fowler.
15. Understanding the Earth: I.G. Guass, P.S. Smith and R.G.L. Wilson
16. The Dynamic earth- A textbook in Geosciences: P.J. Wyllie
17. Physics and Geology: J.J. Jacobs, R.D. Russel and J.T. Killson
18. Fundamental of Geodynamics, A.E. Schieddeggan.
19. Aspects of tectonics-K.S. Validya.
20. The Inaccessible Earth, G.C.Brown and A.E. Mussett.
21. Understanding the Earth:G.Brownn,C.Hawkesworth and C.Wilson

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **1st**
SUBJECT CODE: **GEOL-102**
COURSE TITLE: **GEOSCIENCES-II**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: The course is intended to familiarize the students with the different branches of Geology.
OUTCOME: Students will get the knowledge about the basics of Palaeontology, Stratigraphy, Structural Geology, Engineering Geology, Mining and Remote Sensing.

Unit No.	Contents
UNIT-I	Principles of stratigraphy, stratigraphic correlation principles; Geological Time Scale, Methods of age determination in Geo-Sciences, Evolution of life through geological ages; fossils, essential conditions of fossilization;
UNIT-II	Basic concepts and broad classification of groups in Vertebrate and Invertebrate paleontology, Palynology and its applications. Use of microfossils in hydrocarbon exploration. Kerogen types and process of transformation of organic matter Petroleum system: Source rock, migration, reservoir rock and traps.
UNIT-III	Introduction to Structural Geology: Elementary ideas about attitude of a bed; contours, topographic and geological maps, tectonic framework of India; Unconformity: types and significance. Engineering properties of rocks, Rock Mass Classification, types of dams, Tunnels: structure and seepage problem, Landslides: classification, causes and preventative measures.
UNIT-IV	Classification of ore deposits, Elements of mineral exploration and mining, methods of mining (alluvial, opencast and underground); Fundamentals of remote sensing; remote sensing systems; Electromagnetic spectrum; electromagnetic bands in remote sensing. Application of remote sensing in Geosciences.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Doyle, P. and Bennett, M.R., 1996. *Unlocking the Stratigraphic Record,* John Willey.
2. Dunbar, C.O. and Rodgers, J., 1957. *Principles of Stratigraphy.* John Wiley & Sons.
3. Bayly, B., 1992. *Mechanics in Structural Geology,* Springer.
4. An Introduction to the Study of Fossil Plants by Walton, J.
5. Paleontology Invertebrate", CBS Publications. Woods, H.,
6. Vertebrate Paleontology by Chapman & Hall. Benton,M.J.,
7. Paleontology by John Willey & Sons Colbert, R.L.,
8. Shrock&Twinhofel – Invertebrate Paleontology
9. McGowran, B., "Biostratigraphy: Microfossils & Geological Time", Cambridge University Press.
10. Brassier, "Microfossils"
11. Davis, GH. and Reynolds, S.J., 1996. *Structural Geology of rocks and regions,* John Wiley. and Sons.
12. Ghosh, S.K., 1993. *Structural Geology: Fundamentals, and modern developments,* Pergamon Press.
13. Introduction to Petroleum Geology. Gulf Publication Houston, Texas: Holson,G.D. and
14. Tiratsoo,E.N. (1985).
15. Petroleum formation and occurrence. Springer-Verlag : Tissot,B.P. and Welte,D.H. (1984).
16. Elements of Petroleum Geology. Academic Press: Selley,R.C. (1998)
17. Geology of Petroleum. Leverson, A.I.
18. Introduction to Petroleum Geology. Hobson,G.D.
19. Remote sensing Geology (Springer – Verlag). R.P.Gupta
20. Principles and applications of photogeology (Tata – McGraw Hill). Pandey,S.N.
21. Remote sensing in Geology. (John Wiley & sons), B.S.Siegal and A.R.
22. Photogeology. (MCGraw Hill), V.C.Miller and C.F.Miller.
23. Remote sensing and image interpretation (John Wiley & Sons). T.M.Lillesand and R.W. Kieffer.
24. Remote principles and interpretations (W.H. Freeman Company) F.F.Sabbins
25. Remote sensing for earth resources. (AEG publications, Hyderabad), D.P.Rao
26. Mining Engineers hand books. Roberts Peele
27. Mining Geology. Mckinstry,H.E.. Asia publishing house
28. Courses in mining Geology. Arogyaswami,R.P.N., Oxford IBH.
29. Elements of mining. Clark,G.B. John Wiley.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **1st**
UBJECT CODE: **GEOL-103**
COURSE TITLE: **MINERALOGY AND CRYSTALLOGRAPHY**
MARKS: **EXTERNAL:80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To provide knowledge about basics of Mineralogy and Crystallography in Geosciences.
OUTCOME: The students will get to know about fundamentals of crystallography and mineralogy so that they can understand Geosciences.

Course Contents:

Unit No.	Contents
UNIT-I	Mineralogy: Definition of Mineral, Importance of Mineralogy and Uses of Minerals. Physical and Optical properties (double refraction, polarization, pleochroism, sign of elongation, interference figure and optic sign) for identifications of Minerals. Petro-logical Microscope- parts and their functions.
UNIT-II	Crystallography: Crystal and Crystallization during mineral genesis, Crystal Defects and Twinning, Nature of chemical bonding and their effects. Concept of Space Lattice and unit cell, Miller Indices, Crystal forms, elements of symmetry, Concept of point group and holohedral classes, Morphological classification of crystals into systems.
UNIT-III	Chemical Analysis of Minerals, Transformation of minerals – polymorphism, Isomorphism, polytypism. Solid solution and ex-solution. Classification of Minerals. Silicate Structures classification, General characters of common rock forming mineral groups-Silicates, Oxides and Carbonates ,
UNIT-IV	Common minerals of igneous, Sedimentary and metamorphic rocks, physical and optical properties of common minerals of rock-forming minerals groups-Quartz, olivine, garnet, alumina-silicates, pyroxene, amphibole, mica, feldspar and clay minerals.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. The rock forming minerals. Deer,W.A., Howie,R.A. and Zussman,J. Longman.
2. Manual of Mineralogy. Klein,C. and Hurlbut,Jr.C.S. John Wiley.
3. Introduction to Mineral Sciences. Putnis,A. Cambridge University press.
4. Mineralogical phase equilibria and Pressure-Temperature-Time paths. Spear,F.S. Mineralogical Society of America Publ., 1993.
5. Optical Mineralogy. Phillips,W.R. and Griffen,D.T. CBS publishers.
7. Dana's text book of Mineralogy. Ford,W.E. Wiley Eastern.
8. Rutley's Elements of Mineralogy. Read,H.H. CBS publishers.
9. Mineralogy. Berry, Mason and Dictrich. CBS publishers.
10. Optical Mineralogy. Kerr,P.F.
11. Text book of Mineralogy. Winchell,A.N.
12. Optical Mineralogy. Wahlstrom,E.E.
13. Elements of Optical Mineralogy I & II. Winchell,A.N
14. Practical Manual of crystal optics. Babu,S.K. and Sinha,D.K. CBS Publishers.
15. Mineral optics. Phillips,R.W. Freeman & Company, USA.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **1st**
SUBJECT CODE: **GEOL-104**
COURSE TITLE: **IGNEOUS PETROLOGY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** The objective of the study to understand how the final appearance and characteristics of igneous rocks is controlled by chemical and physical properties of magmas and their surroundings.
OUTCOME**:** Study of igneous rocks is a key component of geology curriculum (because these rocks not only abundant throughout the crust of the Earth, but, dominate some crustal and upper mantle environments) that provides understanding of melt generation and crystallization mechanisms, diverse rock types and their link to tectonic settings.

Course Contents:

Unit No.	Contents
UNIT-I	Magma and types of magma, Viscosity, temperature and pressure relationships in magmas, partial melting mechanisms and magma generation, magmatic evolution (differentiation, assimilation, mixing and mingling)
UNIT-II	Binary: albite-anorthite, forsterite-silica and diopside-anorthite and ternary: diopside-forsterite-silica, diopside-forsterite anorthite phase diagrams and relevance to magmatic crystallization, Q-Or-Ab system.
UNIT-III	IUGS classification of plutonic and volcanic rocks, Variation diagrams, petrogenesis of major igneous rocks such as granite, basalts, komatiites and alkaline rocks (carbonatite, kimberlite, lamprophyre and nepheline syenite).
UNIT-IV	Structures and textures of igneous rocks; Mantle plume, hotspot magmatism and large igneous provinces of India. Deccan traps

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine question one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will required to attempt one question from each unit. All questions will carry equal marks.

Books Recommended:

1. Best, M. G. Igneous and Metamorphic Petrology, 2nd Edn., Blackwell, 2003
2. Cox, K. G., Bell, J. D. and Pankhurst, R. J. The Interpretation of Igneous Rocks. Unwin Hyman, 1979
3. Hall, A. Igneous Petrology, 2nd Edn., Longman, 1996
4. McBirney, A. R. Igneous Petrology, 3rd Edn., Jones & Bartlett, 2006
5. Middlemost, E. A. K. Magmas and Magmatic Rocks. Longman, 1985
6. Parfitt, E. and Wilson, L. Fundamentals of Physical Volcanology. Wiley-Blackwell, 2008.
7. 2nd Ed., Winter, J. D. Introduction to Igneous and Metamorphic Petrology. Prentice-Hall India, 2010

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **1st**
SUBJECT CODE: **GEOL-105**
COURSE TITLE: **STRUCTURAL GEOLOGY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** Know the classification and mechanism of faults and fractures, the rock-types associated with them. Know the types of foliation and lineation, their origin, and their relationship to folding and fabric.
OUTCOME**:** Successful students in this course be able to demonstrate proficiency in common skills in Structural Geology, including structural features of a region from this interpret geological history of area. Successful students be able to apply this study in various other branch of Geology e.g. Groundwater geology, petroleum geology, engineering geology etc.

Course Contents:

Unit No.	Contents
UNIT-I	Mechanical properties of rocks and their controlling factors. Theory of rock failure. Concept of stress and strain and their relationships of elastic, plastic and viscous materials. Types of strain ellipses and ellipsoids, their properties and geological significance. Strain markers in naturally deformed rocks.
UNIT-II	Fold anatomy, classification and mechanism of folding and field evidence of fold. Fractures and Joints: Their nomenclature, age relationship, origin and significance. Causes and dynamics of faulting, strike-slip faults, normal faults, overthrust and nappe and field evidences of faults.
UNIT-III	Effect of confining Pressure, Temperature, Pore-fluid pressure, and strainrate in rocks. Shear Zones: Brittle and ductile. Mylonites and cataclasites-their origin and significance. Structural behavior of diapirs and salt domes. Major tectonic features and associated structures in extensional-, compressional-, and strike-slip-terrenes.
UNIT-IV	Concept of petro-fabrics and symmetry. Foliation and lineation, their origin and significance. L-, L-S-, and S-tectonic fabrics. Use of stereographic and equal area projections. Time relationship between crystallization and deformation.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine question one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will required to attempt one question from each unit. All questions will carry equal marks.

Books Recommended:

1. Ghosh, S.K. (1993): Structural Geology: Fundamental and Modern Development. Pergamon Press.
2. Grohong, R.H (2006): 3-D Structural Geology, Springer-Berlin-Hydelberg-New York
3. Fossen, H. (2010): Structural Geology, Cambridge University Press
4. Hatcher Jr. R.D. (1990): Structural Geology, Merrill Publishing Company.
5. Leyshon, P. R. And Lisle, R.J (2004): Stereographic projection techniques for geologists and civil engineers, Cambridge University Press
6. Ramsay J.G. and Huber M.I. (2002): The Techniques of modern structural geology, 2nd ed., Vol. 2, Elsevier Science Ltd.
7. Ramsay, J.G. (1967): Folding and fracturing of rocks, McGraw Hill.
8. Ramsay, J.G. and Huber, M.I. (2000): Techniques of Modern Structural Geology, Vol. III (Application of continuum mechanics), Academic Press.
9. Turner, F.J. and Weiss, L.E. (1963): Structural analysis of Metamorphic Tectonites, McGraw Hill.
10. 10.Twiss R.J. and E. M. Moores, 1992. Structural Geology, Freeman.
    11. Park, R.G., 1982. Foundations of Structural Geology (2nd Edition), Blackie (1982).
11. Windley B. (1973): The Evolving continents, John Wiley and Sons, New York.
12. Gokhale, N. W. (2009): A Manual of Problems in Structural Geology, CBS Publications.
13. Bose, N. and Mukherjee, S. (2017): Map Interpretation for Structural Geologists, Elsevier.
14. Passchier, C.W., and R.A.J. Trouw, 1996. Microtectonics, Springer.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**1st**
SUBJECT CODE:	**GEOL-106**
COURSE TITLE:	**PRACTICAL BASED ON GEOL-101, GEOL-102 AND GEOL-103**
MARKS:	**EXTERNAL: 100**
CREDITS:	**4**
EXAM DURATION:	**Practical: 03 HOURS**

Course contents:

Lab work based on Geosciences-I

- Study of Internal Structure of Earth with Models.
- Earthquake Zonation map of India.
- Physiographic map of India.
- Distribution of Volcanoes on Globe.

Lab work based on Geosciences-II

- Megascopic study of important invertebrate, vertebrate and plant fossils;
- Microscopic study of important invertebrate and vertebrate fossils and palynomorphs

Lab work based on GEOL-103

- Megascopic study of common rock forming minerals in hand specimen.
- Practice on setting of Petro-logical microscope with use of its parts.
- Optical properties of common minerals under Plan and cross polarized light.
- Identifications of crystal forms on crystalline mineral specimen & Models.
- Practice on basic methods to determine the chemical composition of minerals.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**1st**
SUBJECT CODE:	**GEOL-107**
COURSE TITLE:	**PRACTICAL BASED ON GEOL-104 AND GEOL-105**
MARKS:	**EXTERNAL: 100**
CREDITS:	**4**
EXAM DURATION:	**Practical: 03 HOURS**

Course Contents:

Lab work based on GEOL-104

- Study of igneous rocks in hand specimens
- Study of Textures of Igneous Rocks under the petrological microscope
- Norm calculations and application of Geosoftware

Lab work based on GEOL-105

- Preparation and interpretation of Geological maps and sections;
- Structural problems based on orthographic and stereographic projections
- Recording and plotting of the field data
- Study of the hand specimen of deformed structures;
- Practical Strain Analysis
- Structural problems related to borehole data

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

GEOL-108 GEOLOGICAL FIELD TRAINING-I					
Duration	**Credit**	**Internal**	**External**	**Total**	**Exam**
7-10 days	**6**	**40**	**60**	**100**	**Report submission and Viva after completion of field training**
OBJECTIVE					
To impart understanding of geological fields and to get familiar with the basic use of geological equipment.					
COURSE OUTCOME					
Students get knowledge about Brunton compass, topographic sheet, geological maps and mapping and their uses in field.					

Course Contents:

- Study of topographic-sheets and geological maps
- Determination of location on maps
- Measurement of dip and strike of planar surfaces
- Understanding of stratigraphic column
- Geological mapping
- Plotting and analysis of field data and preparation of field training report

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **2nd**
SUBJECT CODE: **GEOL- 201**
COURSE TITLE: **GEOMORPHOLOGY AND GEOTECTONICS**
MARS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** The course provides an overview of the landforms, land forming processes, and landscape evolution. In particular, it aims to shed light on various land forming processes and how these depend on climate and tectonic regime and time. The course shall further convey an understanding of land forming processes on different temporal and spatial magnitude.
OUTCOME**:** The course will provide an understanding of the conceptual and dynamic aspects of landform development. Students will also learn the relevance of applied aspects of Geomorphology in various fields. Successful students in this course be able to understand evolution of the Great Himalaya and other mountains of the world.

Course Contents:

Unit No.	Contents
UNIT-I	Basic concepts and significance of Geomorphology; Cycle of erosion; Landforms produced by geomorphic agents: Fluvial, Coastal, Glacial and Aeolian landforms; desert type; Neotectonics: Geomorphological indicators, active faults, drainage changes, recurrent seismicity.
UNIT-II	An elementary idea about morphogenesis and morphography; Morphometric analysis; Morphochronology; Geomorphology of India - Peninsular, extra-peninsular and Indo-Gangetic Plains. Application of Geomorphology in Mineral Prospecting, Civil Engineering, Military purposes, Hydrogeology and Environmental studies.
UNIT-III	Introduction to geotectonics; Continental drift, seafloor spreading and convection current hypotheses; Paleomagnetism, polar wandering and reversal of earth's magnetic field; Geomagnetic time scale; Mantle Plume models of plate movements.
UNIT-IV	Principal tectonic feature of the Earth-Precambrian shields, Phanerozoic region, feature of plate tectonic boundaries, nature and types of plate margins; Anatomy of orogenic Belts; Orogeny and Epeirogeny; Geodynamic Evolution of Himalaya.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Holmes, A. 1992: Holmes Principles of Physical Geology Edited by P. McL. D. Duff. Chapman and Hall, London.
2. Summerfield (2000): - Geomorphology and Global Tectonics
3. Thornbury W. D. 2004: - Principles in Geomorphology
4. Kale V S and Avijit Gupta 2010: Introduction to geomorphology. University Press
5. Bloom, A. L. 2011: Geomorphology: A systematic analysis of Late Cenozoic Landforms 3rd Edition. Rawat Publications
6. Gass I.G. et al 1982: Understanding the Earth. Artemis Press (Pvt) Ltd. U.K.
7. Condie, Kent. C. 1989. Plate Tectonics and Crustal Evolution. 3rd Edition. Butterworth-Heinemann Ltd.
8. Windlley B. 1995: The Evolving Continents. 3rd Edition Wiley-Blackwell.
9. Davies, G.F. 1999: Dynamic Earth: Plates, Plumes and Mantle Convection. Cambridge University Press.
10. 10.Keller, E.A and Pinter, N 2001: Active Tectonics. 2nd Edition. Pearson Publications.
11. Kearey P, Klepeis, K A and Vine, F.J 2009: Global Tectonics 3rd Edition. Wiley-Blackwell.
12. Burbank D W and Anderson R S 2016: Tectonic Geomorphology

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **2nd**
SUBJECT CODE: **GEOL-202**
COURSE TITLE: **PALEONTOLOGY AND STRATIGRAPHY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** Paleontology and Stratigraphy are at the core of geological studies. In order to understand the geological history of earth, it is essential to learn about the life, its origin and how it has evolved over the years. In tandem with Stratigraphic studies, the course will give students the understanding of the geological history of the planet.
OUTCOME**:** In tandem with Stratigraphic studies, the course will give students the understanding of the geological history of the planet.

Course Contents:

Unit No.	Contents
UNIT-I	Introduction to Paleontology and its branches. Fossils and Types of Fossils. Modes of preservation and conditions for fossilization. Geological time scale and prehistoric life. Major events in the evolution of life. Bathymetric Distribution of life.
UNIT-II	Paleontology and types. Functional Morphology, evolutionary trends and geological history of: Brachiopods, Trilobites, Corals, Gondwana Flora and Fauna.
UNIT-III	Stratigraphy and principles of Stratigraphy: History and Development. Matching and correlation. Stratigraphic procedures (Surface and Subsurface); Concept of Lithofacies and Biofacies. Stratigraphic nomenclature (Lithostratigraphic, Biostratigraphic and Chronostratigraphic).
UNIT-IV	Stratigraphic Correlation physical and palaeobiologic criteria of corelation. Concepts of Magnetostratigraphy, Chemostratigraphy, Event stratigraphy, Cyclostratigraphy and Sequence stratigraphy; Radioisotopes and measuring geological time.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Invertebrate Paleontology and Evolution, Blackwell: Clarkson, E. N. K.
2. Paleontology: The record of Life, John Wiley; Stearn, C. W. & Carroll, R. L.
3. Systematics and the Fossils Records-Documenting Evolutionary patterns. Blackwell; Smith, A.B.
4. Bringing fossils to life- An introduction to Paleobiology. McGraw Hill: Prothero, D. R.
5. Elements of Micropaleontology. Graham and Trotman: Bignot, G.
6. Palaeontology (Palaeobiology) Evolution and Animal Distribution. Jain, P. C. & Anantharaman, M. S.
7. Microfossils. Brasier, M.
8. Principles of Sedimentology and Stratigraphy. Boggs, Sam Jr.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **2nd**
SUBJECT CODE: **GEOL-203**
COURSE TITLE: **METAMORPHIC PETROLOGY**
MARKS: **EXTERNAL:80, INTERNAL:20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** The solid-state transformations of rocks which hold clue to the past processes which are not possible to reconstruct by other means. This course aims to enable students to identify critical data as well as provide theoretical basis for interpreting this data for past geodynamic processes, especially the orogenic events.
OUTCOME**:** Identifying equilibrium mineral assemblages through textural and mineralogical observations. Plotting the quantitative as well as qualitative mineral and mineral assemblage data to interpret the discontinuous reactions and to infer the nature of continuous reactions.

Course Contents:

Unit No.	Contents
UNIT-I	Metamorphism: Types of metamorphism and physico-chemical controls (pressure, temperature, fluids and bulk rock composition) of metamorphism; metamorphic structures slate, schist and gneiss; metamorphic textures- pre, syn and post tectonic porphyroblasts
UNIT-II	Concept of zones, facies, isograds and facies series, protolith types and characteristic metamorphic minerals, thermodynamic principles of metamorphic reactions
UNIT-III	Construction and interpretation of ACF, AKF and AFM diagrams, Schrienmaker's rule and construction of petrogenetic grid, geothermobarometry; P-T-t paths
UNIT-IV	Regional metamorphism of pelitic, carbonate and mafic rocks; contact metamorphism; granulite, eclogite and migmatite, Metamorphic differentiation and anatexis, metamorphic terrains in relation to plate tectonics, Paired metamorphic belts

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Bucher, K. and Grapes, R., 2010. *Petrogenesis of Metamorphic Rocks,* Springer.
2. Fry, N., 1985. *Field Description of Metamorphic Rocks,* New York, Geological Society of London Handbook Series.
3. Best, M.G., 2003. *Igneous and Metamorphic Petrology,* Blackwell Science. 28
4. 4 Vernon, R.H.,and Clarke G. L. 2008. Principles of Metamorphic Petrology, Cambridge University Press.
5. 5.2nd Ed., Winter, J. D. Introduction to Igneous and Metamorphic Petrology. Prentice-Hall India,2010
6. Yardley, B.W.D., 1997. *An Introduction to Metamorphic Petrology,* Longman Earth Science
7. Stuwe, K. Geodynamics of the Lithosphere. Springer-Verlag, 2007
8. Philopotts, A.R. Principles of Igneous and Metamorphic Petrology, Prentice Hall, 1994

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **2nd**
SUBJECT CODE: **GEOL-204**
COURSE TITLE: **ENGINEERING GEOLOGY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** The principle objective of Engineering Geology is to utilize the geological knowledge to design and develop safe structures against odds. The purpose is assuring that the geological factors regarding location, design and construction are recognized and accounted for.
OUTCOME: This will help students to develop an understanding of the geological factors responsible to create a sound structure whether it is a dam, tunnel or bridge. It may ensure that students understand the factors responsible for instability of slope and how to improve slope stability.

Course Contents:

Unit No.	Contents
UNIT-I	Geological structures and discontinuities, engineering properties of rocks, engineering properties of jointed rocks, Rock Mass Classification: rock quality design index, rock structure rating, rock mass ratings, and rock quality index. Slope mass ratings.
UNIT-II	Soil profile, soil classifications and types, Atterberg's limits, porosity, permeability and weathering, swelling and pore pressure of soils, cohesion and friction of soil, Mohr's envelope.
UNIT-III	Rock slope engineering - factors influencing slope stability, factor of safety of a slope, analysis of slope failure, monitoring of slope stability, improving slope stability.
UNIT-IV	Geotechnical investigation for dam site, reservoir site; geotechnical study for road alignment; geotechnical evaluation of tunnel alignment, methods of tunneling, classification of ground for tunneling purposes, various types of support system; geotechnical investigations for bridge foundation and building foundation; Rock burst and bumps.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine question one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will required to attempt one question from each unit. All questions will carry equal marks.

Books Recommended:

1. Engineering Geology. Krynine and Yudd. CBS publishers
2. Soil mechanics. Lambe.T.W. and Whitman,R.
3. A text book of soil mechanics. Bharath Singh and Shansheed Prakash.
4. Soil mechanics. Trytovich,N.
5. Design of small dams. Udall,S.L. and Dominy,F.E.
6. Manual of Engineering Geology. Blyth.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **2nd**
SUBJECT CODE: **GEOL-205**
COURSE TITLE: **CLIMATOLOGY AND OCEANOGRAPHY**
MARKS: **EXTERNAL:80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE**:** The atmosphere and climate are a critical part of the earth system, and climatic variability and change are central to the issue of current and future global environmental change. The broad objective of the course is to introduce to the students the fundamentals of atmospheric phenomena, global climate systems and climate change.
OUTCOME**:** On successful completion of this course, students should be able to understand the mean global atmospheric circulations and disturbances, world climate systems, climatic variability and change.

Course Contents:

Unit No.	Contents
UNIT-I	Nature and Scope of Climatology, Climatic elements – atmospheric temperature, pressure, moisture: forms of condensation and precipitation, general atmospheric circulations and processes; Earth's radiation balance; cloud formation and precipitation, water balance. Air masses; Jet streams; tropical cyclones.
UNIT-II	Cloud classification, condensation nuclei, growth of cloud drops and ice-crystals, precipitation mechanisms: Bergeron, Findeisen process, coalescence process – Precipitation of warm and mixed clouds, artificial precipitation, hail suppression, fog and cloud – dissipation. Global warming, Impact of Global Warming.
UNIT-III	Indian Summer Monsoon and ENSO and Indian Ocean dipole. Quaternary climates –glacial-interglacial cycles, eustatic changes, proxy indicators of paleoenvironmental/ paleoclimatic changes, - land, ocean and cryosphere (ice core studies).
UNIT-IV	Ocean Circulation, Coriolis Effect and Ekman spiral, convergence, divergence and upwelling; Oceanic sediments: Factors controlling the deposition and distribution of oceanic sediments; Opening and closing of ocean gateways and their effect on circulation and climate during the Cenozoic. Structure, composition and mechanism of the formation of oceanic crust.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

Climatology-

1. Menon, P.A. (1989), Our Weather, N.B.T., New Delhi.
2. Das, P.K. (1987), Monsoons, National Book Trust, New Delhi.
3. Fein, J.S. and Stephens, P.N. (1987), Monsoons, Wiley, London.
4. Peterson, S. (1969), Introduction to Meteorology, McGraw Hill Book, London.
5. Thompson, R.D. and Perry, A. (ed.) (1997), Applied Climatology: Principles and Practice, Routledge, London.
6. Barry, R.G. and Chorely, R.J., (2004), Atmosphere, Weather and Climate, Methuen, London.
7. Bhutani S., (2000), Our Atmosphere, Kalyanai Publishers, New Delhi.
8. Critchfield, H.J. (1987), Climatology, Prentice Hall, New Delhi. 9. Griffith, J.F. and Driscell, D.M. (1982), Survey of Climatology, Charles Merril, New York.
9. Lal, D.S. (1993), Climatology, Chaitanya Publishing House, Allahabad.
10. Riehl, H. (1968), Introduction to Atmosphere, McGraw Hill, New York.
11. Robinson, P.J. and Sellers, H. (1986), Contemporary Climatology, Longman, London.
12. Trewartha, G.T. (Latest edition) Introduction to Climate, McGraw Hill, New York.

Oceanography-

1. Denny, M. (2008): How the Ocean Works: An introduction to Oceanography, Princeton University Press, New Jersey.
2. Duxbury, C.A and Duxbury, B. (1996): An Introduction to the world's Oceans, 2nd Edition, C. Brown, Iowa.
3. Garrison, T. (1995): Essentials of Oceanography, Wards worth, London.
4. Garrison, T. (2001): Oceanography - An Introduction to Marine Science, Cole Pacific Grove, USA.
5. Gross, M. Grant (1987): Oceanography: A View of the Earth, Prantice - Hall Inc. New Jersy.
6. Kennel, J.P. (1982): Marine Geology, Prentice Hall, New Jersey.
7. Kerhsaw, S. (2004): Oceanography: An Earth Science Perspective, Routledge, London.
8. Sharma, R.C. (1985): The Oceans, Rajesh Publications, New Delhi.
9. Sharma, R.C. and Vatal, V. (1986): Oceanography for Geographers, Chatanaya Publishing, Allahabad..
10. Ummerkutty, A.N.P. (1985): Science of the Oceans and Human Life, NBT, New Delhi. 15. Von, A.W.S. (1962): An Introduction to Physical Oceanography, Addison,

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**2nd**
SUBJECT CODE:	**GEOL-206**
COURSE TITLE:	**PRACTICAL BASED ON GEOL-201 & GEOL-202**
MARKS:	**EXTERNAL:100**
CREDITS:	**4**
EXAM DURATION:	**PRACTICAL: 03 HOURS**

Course Contents:

Lab work based on GEOL-201

- Reading topographic maps
- Concept of scale Preparation of a topographic profile
- Preparation of longitudinal profile of a river
- Calculating Stream length gradient index
- Preparation of geomorphic map,
- Interpretation of geomorphic processes from the geomorphology of the area
- Study of landforms and interpretation of lithology and structure from aerial photographs and satellite images and models.

Lab work based on GEOL 202

- Study of different Proterozoic supercontinent reconstructions
- Megascopic study of different types of fossils.
- Megascopic study of important invertebrate fossils.
- Plant Flora of Gondwana
- Tectonics map of India

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**2nd**
SUBJECT CODE:	**GEOL-207**
COURSE TITLE:	**PRACTICAL BASED ON GEOL-203 & GEOL-204/GEOL-205**
MARKS:	**EXTERNAL: 100**
CREDITS:	**4**
EXAM DURATION:	**PRACTICAL: 03 HOURS**

Course Contents:

Lab work based on GEOL-203

- Study of metamorphic rocks in hand specimens
- Thin section study of important metamorphic rocks, Metamorphic textures and processes,
- Representation of pelitic assemblage in AFM diagrams

Lab Work based on GEOL-204

- Exercises on Engineering Geology maps and sections of dam sites, Reservoir sites, Tunnels, Hill slopes, Open pit slopes.
- Determination of physical properties of rocks and soils i.e. plastic limit, liquid limit etc.

Lab Work based on GEOL-205

- Preparation pf Climatic map of India; and Water cycle
- Interpretation of a daily weather map of India (any two): Pre-Monsoon, Monsoon and Post-Monsoon
- Study of topographic features of ocean floor
- Preparation of bathymetry maps
- Determination of physical and textural properties of marine sediments

CHOICE BASED OPEN ELECTIVE

DEPARTMENT OF GEOLOGY

SUBJECT CODE: **GEOL-OE- 208**
SEMESTER: **2nd**
COURSE TITLE: **GEOSCIENCE AND SOCIETY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **3**
EXAM DURATION: **THEORY: 03 HOURS**

Course Contents:

Unit No.	Contents
UNIT-I	Introduction to Geo-science and its various branches, Earth and its place in solar system. Origin and structure of Earth. Geological time scale. Origin and evolution of life through the Earth history.
UNIT-II	Elementary idea of rocks their types, rock cycle, minerals and gemstones. Elementary idea of various Earth processes, continental drift and plate tectonics. Orogenic and epeirogenic movements.
UNIT-III	Elementary idea of geological considerations in site evaluation of engineering, construction, mining and other geological works.
UNIT-IV	Environmental changes through the Earth history. Significance of earth resources to mankind and society. Hydrological cycle and water budget of an Earth.

Books Recommended:

1. Press, F. and Siever, R., "Understanding the earth", W.H. Freeman & Co.
2. Jain, P.C. and Anantharaman, M.S. Palaeontology,
3. Tarbuck, Lutgens, Tasa, "An Introduction to Physical Geology" Eleventh Edition, Pearson Publication.
4. Krynine/Judd. Principles of engineering Geology and Goetechnics, Jain Book Agency.
5. Tod David K. Ground water Hydrology. PHI Learning.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **3rd**
SUBJECT CODE: **GEOL-301**
COURSE TITLE: **SEDIMENTOLOGY AND FUEL GEOLOGY**
MARKS: **EXTERNAL:80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To understand how the various sedimentary rocks forms in different types of environment, their characteristic and an overview of the various environment and their landforms and study of various sedimentary archive and proxy for the study of pale-climate.
OUTCOME: Sedimentology is the study of sediments, particularly focusing on how it is produced, transported, and deposited.

Course Contents:

Unit No.	Contents
UNIT-I	Sedimentology: definition and scope. Fundamentals of fluids laminar and turbulent flow. Reynolds. Number and Froude number Sedimentary structures (Physical, Chemical, and Biological). Classification of clastic and non-clastic sedimentary rocks. Definition, measurement and interpretation of grain size. Concepts of Sedimentary Environments. Eolian and lacustrine environments;
UNIT-II	Glacial environment; Deltaic and beach barrier island environments; Estuarine, lagoon and tidal environments. Facies definition, Facies association, Walther's law of Facies and Application Heavy mineral and its significance. Provenance and digenesis of sediments. Sedimentary texture. Maturity of sediments.
UNIT-III	Stratum contours and isopach maps. Definition of coal and sapropel, process of coalification – Rank and grades of coal; physical properties of coal, chemical characterization – proximate and ultimate analyses; Lithotypes, microlithotypes and macerals: their physical, chemical and optical properties.
UNIT-IV	Sedimentary basins and their classification. Sedimentary basins of India. Petroliferous basins of India, conventional and unconventional sources of oil and gas in India; Radioactivity and nuclear energy, geological characteristics and genesis of major types of U, Th deposits and their distribution in India.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Blatt, H., Middleton, G.V. and Murray, R.C. (1980) Origin of Sedimentary Rocks, Prentice-Hall Inc.
2. Collins, J.D. and Thompson, D.B. (1982) Sedimentary Structures, George Allen and Unwin, London.
3. Lindholm, R.C. (1987) A Practical Approach to Sedimentology, Allen and Unwin, London.
4. Miall, A.D. (2000) Principles of Basin Analysis, Springer-Verlag.
5. Pettijohn, F.J. (1975) Sedimentary Rocks (3rd Ed.),
6. Harper and Row Publ., New Delhi. Reading, H.G. (1997) Sedimentary Environments and facies, Blackwell Scientific Publication.
7. Reineck, H.E. and Singh, I.B. (1973) Depositional Sedimentary Environments, Springer-Verlag. Selley, R.C. (2000) Applied Sedimentology, Academic Press.
8. Tucker, M.E. (1981) Sedimentary Petrology: An Introduction, Wiley and Sons, New York.
9. Tucker, M.E. (1990) Carbonate Sedimentolgy, Blackwell Scientific Publication. Hota, R.N. (2011) Practical Approach to Petrology, CBS Publisher and Distributors Pvt Ltd., New Delhi
10. Chandra, D., Singh, R.M., Singh M.P., (2000): Text book of coal (Indian context), Tara Book Agency, Varanasi.
11. Scott, A.C., (1987): Coal and coal bearing strata: Recent Advances, Blackwell Scientifics Publications.
12. Stach, E., Mackowsky, M-Th., Tylor, G.H., Chandra, D., Teichumullelr, L . and Teichumuller, R. (1982): Text book on coal petrology, Gebruder Borntreager Stuttgart.
13. Introduction to Petroleum Geology. Gulf Publication Houston, Texas: Holson,G.D. and
14. Tiratsoo,E.N. (1985).
15. Petroleum formation and occurrence. Springer-Verlag : Tissot,B.P. and Welte,D.H. (1984).

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **3rd**
SUBJECT CODE: **GEOL-302**
COURSE TITLE: **ADVANCED PALEONTOLOGY**
MARKS: **EXTERNAL:80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: Paleontology, the study of old life makes a central part of geological and applied geological studies. In order to understand the geological history of earth, it is essential to learn about the life, its origin and how it has evolved over the years.
OUTCOME: In this course we will understand in depth about different life forms that evolved over the years on earth.

Course Contents:

Unit No.	Contents
UNIT-I	Species concept and theories of evolution of life, Pre-cambrian fossil record, Functional Morphology, evolutionary trends and geological history of pelecypods and gastropods, Cephalopods, Graptolites, Echinoderms
UNIT-II	Vertebrate paleontology and evolution through ages. Evolution history of reptiles and mammals (Horses, Elephants and Man) Siwalik vertebrate fauna; Paleontological perspective: Use of paleontological data in a) Stratigraphy b) Palaeoecology and evolution;
UNIT-III	Micropaleontology-Definition and scope. Morphology and geological distribution of: foraminifers, Ostrocods, Conodonts, Radiolarians and Silicoflagelletas
UNIT-IV	Morphology and geological history of Phytoplanktons and dinoflogellates, Acritarchs, chitinozonas Morphology of fossil spores and pollen grains. Application of microfossils and palynofossils in stratigraphy and hydrocabron exploration.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Invertebrate Paleontology and Evolution, Blackwell: Clarkson, E. N. K.
2. Paleontology: The record of Life, John Wiley; Stearn, C. W. & Carroll, R. L.
3. Systematics and the Fossils Records-Documenting Evolutionary patterns. Blackwell; Smith, A.B.
4. Bringing fossils to life- An introduction to Paleobiology. McGraw Hill: Prothero, D. R.
5. Elements of Micropaleontology. Graham and Trotman: Bignot, G. Palaeontology (Palaeobiology) Evolution and Animal Distribution. Jain, P. C. & Anantharaman, M. S.
6. Microfossils. Brasier, M.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **3rd**
SUBJECT CODE: **GEOL-303**
COURSE TITLE: **ORE GEOLOGY AND INDIAN MINERAL RESOURCES**
MARKS: **EXTERNAL:80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To impart basic understanding of different types of mineral deposit and processes of their formation.
OUTCOME: The students will gain knowledge regarding ore deposits, their genesis and mineral economics.

Course Contents:

Unit No.	Contents
UNIT-I	concept of ore and gangue, Elementary aspects of mineral economics. Physico-chemical conditions of ore formation, lithological and structural controls on mineralization, The nature and morphology of the principal types of ore deposit, Classification of ore deposits; Importance of mineral deposits in national economy. Sustainable uses of mineral resources.
UNIT-II	Endogenic processes of ore formation: magmatic ore deposites, volcanic exhalative process, Exogenic processes of ore formation: Mechanical accumulation, sedimentary precipitates, residual concentration, oxidation and supergene enrichment.
UNIT-III	Geology and distribution of important economic deposits of India: Bauxite, iron, manganese, copper, lead, zinc, gold, chromites, diamond, coal, petroleum and nuclear fuel deposits. Metallogeny and its relation to Tectonics and crustal evolution, Global distribution of minerals in time and space. Marine mineral resources.
UNIT-IV	Elements of Geochemical prospecting, Geo-botanical observations during mineral prospecting. Geophysical methods- ground and airborne surveys; gravity, magnetic, electrical and seismic methods of mineral exploration, Basic terminology related to mining, history and future scopes, basic understanding of mining process and industry;

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Economic mineral deposits: Bateman,A.M
2. Geology of India: Day, A.M.
3. Economic mineral deposits: Dorokhin
4. Ore deposits of India: Gokhle, K.V.G.K. and Rao, T.C.
5. Geology of India, Pakistan and Burma, Krishnan, M.S.
6. Applied Geology: Kirsch, Helmut
7. Indian mineral resources: Krishnaswami, S.
8. Geology of mineral deposits: Smirnov, V.I.
9. Ore Petrology: Stanton, R.L.
10. Geology of India: Wadia, D.N.
11. Fundamental of Historical geology and stratigraphy of India: Ravindera, K.
12. Ore Microscopy and ore petrology: Craig, J.R. and Vaughan, D.J.
13. Principles of economic geology: Emmons
14. Mineral deposits Lindgren, W.
15. Bateman, A.M. and Jensen, M.L., "Economic Mineral Deposits", John Wiley & Sons,
16. Guilbert, J.M. and Charles F.P. Jr., "The Geology of Ore Deposits",
17. Waveland Evans, A.M., "Ore Geology and Industrial Minerals": An Introduction",

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**3rd**
SUBJECT CODE:	**GEOL-304**
COURSE TITLE:	**MINERAL EXPLORATION & MINING**
MARKS:	**EXTERNAL:80, INTERNAL: 20**
CREDITS:	**4**
EXAM DURATION:	**THEORY: 03 HOURS**

OBJECTIVE: This course is designed to give an idea about the various types of geological field operations, which are carried out in Mineral Exploration and Mining.
OUTCOME: The students will get knowledge regarding the fundamentals of Mineral Exploration and various mining methods along with mine safety measures and legislations

Course Contents:

Unit No.	Contents
UNIT-I	Basic terminology and definitions. Planning for Prospecting and Exploration Project. Principal steps in the exploration and exploitation of mineral deposits, Geological Exploration concepts. Techniques in mineral exploration: Drilling, Core logging, Modeling of ore body-geological plans and sections.
UNIT-II	Basics of GPR Survey, Remote Sensing & GIS as tool in Mineral Exploration, Geological Sampling Methods, categorization of ore reserves, ore reserve estimation; National Mineral Policy and Legislations;
UNIT-III	Introduction to Mining: Principles of Mining Industry, Mining Operations: Blasting and types of Explosive, Mine support and Mine safety measures, Environmental issues related to mining.
UNIT-IV	Methods of Mining: controlling factors for selection of mining method, Classification of Mining methods, Surface Mining: Mechanical and Aqueous Extraction; Subsurface Mining methods, Mine Mapping- Mapping in Open Cuts & Underground Openings, underground mine mapping, Mine Economic appraisals,: financial management, Resources management, Elements of Mineral Dressing & mineral beneficiation, Role of geologists in mine operations,

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Mining Engineers hand books. Roberts Peele
2. Mining Geology. Mckinstry,H.E.. Asia publishing house
3. Courses in mining Geology. Arogyaswami,R.P.N., Oxford IBH.
4. Elements of mining. Clark,G.B. John Wiley.
5. Waveland Evans, A.M., "Ore Geology and Industrial Minerals": An Introduction",

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**3rd**
SUBJECT CODE:	**GEOL-305**
COURSE TITLE:	**SUMMER INTERNSHIP (ACADEMIC OR INDUSTRIAL)**
MARKS:	**EXTERNAL: 80 INTERNAL: 20**
CREDITS:	**4**
EXAMINATION**:**	**REPORT SUBMISSION & PRESENTATION**
DURATION:	**45 Days**

OBJECTIVE**:** The objective of introducing this course is about encouraging students to understand the on ground work of geologists. To make them utilize their theoretical knowledge to do some real-life tasks in industries. This course may help them to develop an interest in research. OUTCOME**:** The understanding of subject increases by visiting research institutes or industries. The students may learn some of the leading software useful in industries and in research. They shall understand the challenges and required skills to be a researcher or to work in an industry. They shall be motivated to embody those skills and understand the kind of challenges they are going to face after they graduate with a master's degree.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**3rd**
SUBJECT CODE:	**GEOL-306**
COURSE TITLE:	**Practical Based on 301 & 302**
MARKS:	**100**
CREDITS:	**4**
EXAM DURATION:	**Practical: 03 HOURS**

Course Contents:

Lab work based on Paper- 301

- study of clastic and non-clastic rocks in hand specimens
- Study of sedimentary rocks in thin section
- Detailed study of digenetic features in thin sections
- Preparation of thin section of sedimentary rocks.
- Grain-size Analysis by sieving Method
- Study of assemblages of sedimentary structures in context of their pale environmental significance

Lab work based on Paper-302

- Megascopic study of important invertebrate fossils in detail.
- Study of important vertebrate fossils groups.
- Observation over Siwalik vertebrates.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**3rd**
SUBJECT CODE:	**GEOL-307**
COURSE TITLE:	**Practical Based on GEOL-303 & GEOL-304/GEOL-305**
MARKS:	**100**
CREDITS:	**4**
EXAM DURATION:	**Practical: 03 HOURS**

Course Contents:

Lab work based on Paper- 303

- Locating different important mineral deposits on outline map of India /world.
- Megascopic study of ore specimens/industrial minerals.
- Microscopic study of important ore minerals.
- Preparation of polished ore specimen.
- Preparation of Policed Section.
- Parts and functioning of reflected light microscope.

Lab work based on Paper- 304

- Diagrammatic representation of open cast and underground mining.
- Exercise on mine sampling methods
- Core logging
- Ore reserves Estimation
- Geochemical data interpretation in Mineral Exploration
- Ore body delineation.
- Use of mine safety equipment.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

GEOL-308 GEOLOGICAL FIELD TRAINING-II					
Duration	**Credit**	**Internal**	**External**	**Total**	**Exam**
10 days	**6**	**40**	**60**	**100**	**Report submission and Viva after completion of field training**
OBJECTIVE					
To impart understanding of advanced mapping methods and techniques, sampling in field using different tool and instruments.					
COURSE OUTCOME					
Students get knowledge about large scale mapping methods and techniques, sampling in field using different tools and instruments.					

Note: 100 marks to be awarded jointly by the internal and external examiner after conducting viva-voce examination on field training reports.

Course Contents:

- Identification of mappable rock units and common structural and tectonic settings.
- Hands-on training on GPS, Bruton geological compass in field.
- Observations on planar and linear fabric elements.
- Significance and methods for collection of oriented samples in field.
- Large scale mapping on 1:10.00 and 1:10 scale using GPS, Brunton compass, plane table, telescopic alidade & theodolite.
- Visit to at least any one or more of the following applied geological projects: -
  Mineral/Petroleum/Coal and lignite/groundwater exploration, drilling, and development projects; visit to engineering geological sites such as dams, tunnels, high ways, rail roads, bridges, power houses; cement, bricks and tiles industries, marble and granite mining, cutting and polishing; coal washeries, coke-oven plants, steel plants, metalliferous mines ore concentration and smelling plants etc.

CHOICE BASED OPEN ELECTIVE

DEPARTMENT OF GEOLOGY

SUBJECT CODE: **GEOL-OE- 309**
SEMESTER: **3rd**
COURSE TITLE: **NATURAL DISASTERS**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **3**
EXAM DURATION: **THEORY: 03 HOURS**

Course Contents:

Unit No.	Contents
UNIT-I	Introduction to hazards: Hazards' classification and distribution, Natural Hazards and their effects, hazard prediction and early warning, role of community and stake holders.
UNIT-II	Earthquakes: classification, distribution, causes and effects. Tsunami: Types, effects, prediction and early warning systems.
UNIT-III	Landslides: classification, distribution, causes, effects and prevention/mitigation of landslides. Volcan ic hazards: Types, distribution, causes and effects of volcanoes and related hazards.
UNIT-IV	Floods: Types and factors leading to floods, flood control/mitigation measures. Cyclones, thunderstorms and lightening, prediction and early warning, droughts and desertification.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Applied Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-401**
COURSE TITLE: **GEOCHEMISTRY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To provide knowledge regarding basics and Significance of geochemistry in Geosciences.
OUTCOME: The students will get to know the vast applications of geochemistry in the field of geosciences.

Course Contents:

Unit No	Contents
UNIT-I	Cosmic abundance, meteorites-types and composition, bulk composition of the Earth, Goldschmidt's classification of elements, Chemical composition and characteristics of atmosphere, lithosphere and hydrosphere.
UNIT-II	Ionic substitution, fractionation of elements in minerals/rocks: Partition coefficient and bulk partition coefficient; application of trace elements in petrogenesis; Diffusion, activity - composition relation (Roult's law and Henry's law)
UNIT-III	Half-life and decay equation; Principle and application of K-Ar, Rb-Sr, U-Pb, Sm-Nd dating systems; Monazite chemical dating
UNIT-IV	Stable isotopes geochemistry: Carbon, Oxygen and Sulphur, Applications of Stable isotopes in geology

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Anderson, G.M. (2005) Thermodynamics of Natural Systems, Cambridge University Press
2. De Paolo DJ (1988) Neodymium isotope geochemistry: An introduction. Spriger- Verlag New York.
3. Dickin, A. P. (1995). Radiogenic Isotope Geology. Cambridge University Press,.

4. Faure, G (1986) Principals of Isotope Geology, 2nd Edition, Wiley New
5. Faure, G (1998) Principles and Applications of Geochemistry. 2nd Edition Prentice- Hall, New Jersey
6. Faure, G. and Mensing, T. M., Isotopes (2005): Principles and Applications, 3rd Edn. John Wiley & Sons.
7. Hoefs, J (1986) Stable isotope geochemistry 3rd edition. Spriger- Verlag, Berlin.
8. Hugh Rollinson (2007) Using geochemical data - evaluation, presentation and interpretation. 2nd Edition. Publisher Longman Scientific & Technical
9. Mason, B (1986). Principles of Geochemistry. 3rd Edition, Wiley New York.
10. Walther John, V. (2009) Essentials of geochemistry, student edition. Jones and Bartlett Publishers
11. Winter, J. D. (2001). Introduction to Igneous and Metamorphic Petrology. Prentice-Hall.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-402**
COURSE TITLE: **GEOHYDROLOGY**
MARKS: **EXTERNAL 80; INTERNAL 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: Water is a basic need to support life on the Earth. The course objective is to focus on groundwater, formations and types of aquifers. The course imparts knowledge about drilling which is used as potable water and being exploited by over pumping, with aims to enable students to understand about the attributes, occurrence, movement and exploration of the groundwater resources.
OUTCOME: The students will learn about the water bearing formations, water wells and how to acquire various aquifer parameters by carrying out pumping tests, slug tests etc. The students will learn about the methods of groundwater exploration and quality parameters.

Course Contents:

Unit No.	Contents
UNIT-I	Types of water: meteoric, juvenile, magmatic and sea waters; hydrologic cycle, vertical distribution of water: zone of aeration and zone of saturation; Classification of rocks and formations according to their water-bearing properties. Aquifers and their types. Water table and piezometric surface
UNIT-II	Water bearing properties of rocks and aquifer parameters: porosity, permeability, specific yield, specific retention, hydraulic conductivity, transmissivity, intrinsic permeability, storage coefficient, storativity, specific storage Groundwater flow concepts; Darcy's Law in isotropic and anisotropic media and validity;
UNIT-III	Bernoulli equation; determination of hydraulic conductivity in field and laboratory; methods for constructing shallow wells, drilling wells, well completion; testing wells, pumping test, slug tests for confined and unconfined aquifers; fluctuations in groundwater levels
UNIT-IV	Surface investigation of groundwater- geologic, remote sensing, electrical resistivity, seismic, gravity and magnetic methods; sub-surface investigation of groundwater- test drilling, resistivity logging, spontaneous potential logging, radiation logging. Groundwater quality - physical and chemical properties of water, quality criteria for different uses.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Davies, S.N. and De-West, R.J.N., 1966. *Hydrogeology*, John Wiley & Sons, New York.
2. Driscoll, F.G., 1988. *Ground Water and Wells*, UOP, Johnson, Div. St. Paul. Min. USA.
3. Fetter, C.W., 1984. *Applied Hydrogeology*, McGraw-Hill Book Co., New York.
4. Fitts, C.R., 2006. *Groundwater Science*, Academic Press.
5. Freeze, R.A. and Cherry, J.A., 1979. *Groundwater*, Englewood Cliffs, New Jersey: Prentice Hall.
6. Karanth K.R., 1987. *Groundwater: Assessment, Development and Management*, Tata McGraw-Hill Pub. Co. Ltd.
7. Raghunath, H.M., 1987. *Ground Water*, Wiley Eastern Ltd., Calcutta.
8. Schward and Zhang, 2003. *Fundamentals of Groundwater*, John Willey and Sons.
9. Todd, D.K., 2004. *Ground Water Hydrology*, John Wiley & Sons, New

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL- 403**
COURSE TITLE: **STRATIGRAPHY AND PALAEOGEOGRAPHY**
MARKS: **EXTERNAL:80, INTERNAL:20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To provide understanding regarding the hydro-geological properties of water bearing formations and chemical parameters of water.
OUTCOME: The students will get to know the basic concepts of geohydrology, groundwater prospecting and management.

Course Contents:

Unit No.	Contents
UNIT-I	Stratigraphy: Principles and Classification of Stratigraphy– Litho-, Bio-, Chrono-, Magneto stratigraphy. Geological Time Scale. Basic Idea of Sequence stratigraphy Cyclostratigraphy, Pedostratigraphy, Seismic stratigraphy. Correlation: Physical and paleontological correlation method
UNIT-II	Geological evolution of Archean nucleii (Dharwar, Bastar, Singhbhum, Aravalli and Bundelkhand), structure, and economic importance. Eastern Ghats Mobile Belt.
UNIT-III	North Singhbhum Mobile Belt. Proterozoic sedimentary basins (Cuddapah and Vindhyan). Palaeozoic stratigraphy- Paleozoic (Spiti, Kashmir and Kumaon). Gondwana Supergroup. Palaeogeographic reconstruction of Gondwana time, palaeogene and neogene period.
UNIT-IV	Mesozoic (Spiti, Kutch, Narmada Valley and Trichinopoly), Cenozoic (Assam, Bengal basins, Garhwal-Shimla Himalayas); Siwaliks. Boundary problems in Indian stratigraphy. Deccan Traps. Indo-gangetic Alluvial plains.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. M. S. Krishnan (1982), Geology of India and Burma; 6th Ed. CBS Publishers and Distributors (India).
2. Pomerol, C. (1982): The Cenozoic Era? Tertiary and Quaternary, Ellis Harwood Ltd., Halsted Press. Schoch,
3. Wadia, D.N. (1984), Geology of India; 4th edition. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
4. Naqvi, S.M. and Rogers, J.J.W. (1987): Precambrian Geology of India, Oxford University Press.
5. Robert, M. (1989): Stratigraphy: Principles and Methods, Van Nostrand Reinhold, New York.
6. Roy, R. Lemon (1990): Principles of Stratigraphy; Merrill Publishing Company.
7. Doyle, P. and Bennett. M.R. (1996): Unlocking the Stratigraphic Record, John Wiley and Sons.
8. Ohio Boggs, S. (2001): Principles of Sedimentology and Stratigraphy, Prentice Hall.
9. M. Ramakrishnan and R. Vaidyanadhan (2008): Geology of India (Vol. I and II); Geological Society of India, Bangalore.
10. K. S. Valdiya (2010): The Making of India-Geodynamic Evolution; Macmillan Publishers India Ltd. 15

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-404**
COURSE TITLE: **GEOPHYSICAL PROSPECTING AND INSTRUMENTS**
MARKS: **EXTERNAL:80, INTERNAL:20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: Course is designed to give the geology students an introductory idea about the Geophysical prospecting, well logging and various types of instrumentation & analytical techniques used to obtain numerous geological data
OUTCOME: Students will be able to operate various instruments for analytical techniques and understand the Geo-scientific data.

Course Contents:

Unit No.	Contents
UNIT-I	Active source Methods in prospecting: **Seismic Surveying**; reflection and refraction methods, travel time curves for flat and inclined interface, 2D Seismic survey, 3D Seismic survey, time lapsed 3D survey, applications of seismic surveying. **Electrical Surveying**: apparent resistivity, different electrode configurations, sounding and profiling, data interpretation and applications. **Electromagnetic Surveying**: Depth of penetration of electromagnetic fields, Airborne electromagnetic surveying, Ground Penetrating Radar (GPR), applications of electromagnetic surveying.
UNIT-II	Passive Source methods in prospecting: **Gravity Surveying**: Basic theory, unit of gravity, geoid, spheroid, gravimeter, corrections and anomalies, applications of gravity surveying. **Magnetic Surveying**: Physics of magnetism, the geomagnetic field, Rock magnetism, magnetometer, applications of magnetic surveying. **Magnetotelluric Surveying**: Theory and prospecting techniques
UNIT-III	**Geophysical borehole logging**: Gamma, SP, Resistivity, Neutron and Sonic logging techniques and applications
UNIT-IV	XRD analysis for mineral structures, Atomic Spectrophotometry; ICP-Mass spectrometry; X-ray fluorescence spectrometry; Electron microscopy and electron-probe microanalysis.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Telford, W.M., Geldart, L.P. and Sheriff, R.E., "Applied Geophysics", Cambridge University Press.
2. Kearey, P. Brooks, M. and Hill, I., "An Introduction to Geophysical Exploration: Blackwell.
3. Lowrie, W. “Introduction to Geophysics”
4. Lillie, R.J. “Whole Earth Geophysics”
5. Fowler, C.M.R., “Solid Earth Geophysics”
6. Parasnis, D.S., "Principles of Applied Geophysics", Champan and Hall.
7. Dobrin, M.B. and Savit, C.H., "Introduction to Geophysical Prospecting". McGraw-Hall.
8. Serra O., “Fundamentals of well log interpretation”
9. Asquith G. and Krygowski D., “ Basic Well Log Analysis”
10. Rider, M. “The Geological Interpretation of Well Logs”
11. Log Interpretation Principles/ Applications by Schlumberger
12. Pirsson, S.J., “Handbook of Well Log Analysis”
13. Potts, P.J., “A Handbook of Silicate Rock Analysis”

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-405**
COURSE TITLE: **ENVIRONMENTAL GEOLOGY**
MARKS: **EXTERNAL: 80, INTERNAL: 20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To provide knowledge regarding basic concepts of environmental geology.
OUTCOME: The students will acquire knowledge regarding our environment and its significance in the field of geology and our society.

Course Contents:

Unit No.	Contents
UNIT-I	Components of environment, ecology and ecosystem. Interactions between atmosphere, hydrosphere, lithosphere, biosphere and man. Principles of environmental geology, ethics of conservation; food chain link. Atmosphere and increasing trend of CO_2 and other greenhouse gases. Fossil fuel burning, ozone layer and global warming. Smog pollution and acid rains, causes and remedies, Other causes of pollutions.
UNIT-II	Hydrologic cycle and earth's water balance, pollution of surface and sub-surface water. Water quality criteria for domestic and industrial uses; water quality degradation due to use of fertilizers and pesticides. Hydrogeologic considerations for liquid waste disposal. Hydrologic implications of solid waste disposals. Waste (solid, liquid, gases) management and control.
UNIT-III	Natural resources of lithosphere, land, soil and minerals and their depletion. Land degradation due to natural hazards. Land conservation and land use planning. Watershed management. Impact of irrigation – water logging and soil degradation. Energy minerals and their conservation; nonconventional sources of energy.
UNIT-IV	Types of micro-organisms, role of sulfur, nitrogen and iron bacteria in environment. Biogeochemistry of iron, manganese and sulfur. Marine pollution-causes and controls. Environmental impact assessment – impact of mining on environment; environmental health and environmental law in India.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Environmental geology: Lindgren, L.
2. Environmental geology: Keller, E.A.
3. Organic micro-pollutants in the aquatic environment: Angeletti, G.
4. Interaction between natural system and man environmental geoscience: Strahler, A.N.
5. A text book of environmental chemistry and pollution control: Dara, S.S
6. Water pollution: Tripathi, A.K. and Panday, S.N.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-406**
COURSE TITLE: **REMOTE SENSING & GIS**
MARKS: **EXTERNAL:80, INTERNAL:20**
CREDITS: **4**
EXAM DURATION: **THEORY: 03 HOURS**

OBJECTIVE: To introduce the principles of Remote Sensing, GIS Technology and its application in the field of Geoscience.
OUTCOME: Acquisition of knowledge regarding basics of remote sensing, GIS and their application in geo-science.

Course Contents:

Unit No.	Contents
UNIT-I	Introduction: Definition and Process, Advantages and limitations, a brief history of Remote Sensing with technological evolution, Electromagnetic Radiation and EM Spectrum, Interaction of radiation with atmosphere and objects with special emphasis on Atmospheric windows. Type of Platform and Sensors. Aerial photography: Types of aerial photographs, Photogrammetry interpretations: Scale, Height determination and relief displacement, fundamentals of Stereoscopic studies;
UNIT-II	Satellite Remote Sensing: concept of sensor's resolutions, Indian Space programme. Land Observation Satellites/Sensors, Basics of Microwave Remote Sensing and its scope for Geological applications. Image Quality: Factor effected the Quality of image, Fundamentals of digital image processing: pre –processing: Geo-matric and Radiometric corrections, enhancements, classification; Principles of image interpretation and Analysis;
UNIT-III	GIS: Basic concept and definitions, functions of GIS; Components of GIS: Hardware, software and their specifications for GIS. GIS data types. Raster and vector data models. Errors in GIS data- their detection and optimization; Concept of thematic layers and topology. Digital terrain model and their applications. Global positioning system and It's applications.
UNIT-IV	Applications of Remote Sensing and GIS technology: Photointerpretation to geology: Image characteristics of geological structures and various rock type, landforms and lineaments; Remote Sensing Applications in Earth Resource Management: natural hazards and disaster mitigation, Mineral Exploration and environmental monitoring. GIS as multidisciplinary tools and their applications in Earth Sciences.

Note: The examiner will set nine questions and the candidates will be required to attempt five questions in all. Out of nine questions, one question will be compulsory containing eight short answer type questions covering the entire syllabus. Further, examiner will set two questions from each unit and candidate will be required to attempt one question from each unit. All questions will be carrying equal marks.

Books Recommended:

1. Remote sensing Geology (Springer – Verlag). R.P.Gupta
2. Principles and applications of photogeology (Tata – McGraw Hill). Pandey,S.N.
3. Remote sensing in Geology. (John Wiley & sons), B.S.Siegal and A.R.
4. Photogeology. (MCGraw Hill), V.C.Miller and C.F.Miller.
5. Remote sensing and image interpretation (John Wiley & Sons). T.M.Lillesand and R.W. Kieffer.
6. Remote principles and interpretations (W.H. Freeman Company) F.F.Sabbins
7. Remote sensing for earth resources. (AEG publications, Hyderabad), D.P.Rao.
8. Manual of Remote sensing. (American Society of Photogrammetry).
9. Principles of Remote Sensing. (ELBS, London), P,J. Currian
10. Advances in Geophysics Vol. 1 and 13 (Academic Press) H.E. Landsberg.
11. Hand book/ brochures issued by Geological Survey of India (Airborne Mineral Survey and Exploration Wing), Atomic energy commission (Atomic Minerals Division) and National Geophysical Research Institute.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT: **GEOLOGY**
COURSE: **M.Sc. Geology**
SEMESTER: **4th**
SUBJECT CODE: **GEOL-407**
COURSE TITLE: **PRACTICAL BASED ON GEOL-401 & GEOL-402**
MARKS: **100**
CREDITS: **4**
EXAMINATION DURATION: **Practical: 03 HOURS**

Course Contents:

Lab work based on Paper- 401

- Techniques of Chemical analysis of rocks and minerals.
- Preparation of standards.
- Problems based on radiometric systems.
- Problems based on fractionation of stable isotopes

Lab work based on Paper-402

- Depth to water level and water table contour map-based exercise.
- Numerical problems related to estimation of permeability in laboratory and field.
- Water chemistry representation by plots and diagrams i.e. Pie, bar, diamond, etc.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

DEPARTMENT:	**GEOLOGY**
COURSE:	**M.Sc. Geology**
SEMESTER:	**4th**
SUBJECT CODE:	**GEOL-408**
COURSE TITLE:	**PRACTICAL BASED ON GEOL-403 & GEOL-405/GEOL-406**
MARKS:	**100**
CREDITS:	**4**
EXAM DURATION:	**Practical: 03 HOURS**

Course Contents:

Lab work based on Paper- 403

- Demarcation of different stratigraphic units of India on Map.
- Chronological sequence of stratigraphic units of an area.
- Practice for Litholog preparation and correlation.

Lab work based on Paper- 405

- Practice on Environmental data collection and interpretation.
- Exercise on Environmental impact assessment

Lab work based on Paper- 406

- Practice for Stereoscopic vision.
- Visual interpretation of remote sensing data.
- Practice on digital image processing
- GPS data collection and integration with GIS.
- Basic practice on GIS Software.
- Maps preparation in GIS.
- Practice on topology and thematic mapping in GIS

Scheme and Syllabi
of
Post Graduate Diploma of Computer Applications
(PGDCA)

One Year Programme

CHOICE BASED CREDIT BASED SYSTEM
(80:20)

(w.e.f. session 2019-20)

Department of Computer Science& Engineering

Indira Gandhi University Meerpur,
Rewari

SCHEME OF EXAMINATION
P G D C A (Choice Based Credit System)

Semester I

Paper No	Nomenclature of Paper	Total Credits	No. of Hours
PGDCA101	Introduction to Information Technology	4	4
PGDCA102	Computer Programming Using C	4	4
PGDCA103	Operating Systems	4	4
PGDCA104	Database Management Systems	4	4
PGDCA105	Web Technologies	4	4
PGDCA106	Software Laboratory –I Programming using C	2	4
PGDCA107	Software Laboratory –II HTML and MS-Office	2	4
PGDCA108	Seminar	1	2
Total		**25**	**44**

Semester –II

Paper No	Nomenclature of Paper	Total Credits	No. of Hours
PGDCA201	Data Structure and Algorithms	4	4
PGDCA202	Computer Networks	4	4
PGDCA203	Object Oriented Systems and C++	4	4
PGDCA204	Computer Organization	4	4
PGDCA205	Software Engineering	4	4
PGDCA206	Software Laboratory –III Data structure implemented in C/C++	2	4
PGDCA207	Software Laboratory –IV Programming in C++	2	4
PGDCA208	Seminar	1	2
Total		**25**	**44**

Grand total of Credits (Semester I and II)	**88**

Note:

1) One credit in theory paper is equivalent to one hour classroom teaching per week.
2) One credit in practical/lab course is equivalent to 2 hours practical/lab work per week
3) A teacher will conduct practical class in a group of 15-20 students.

PGDCA101:Introduction to Information Technology

General Course Information:

Course Code: PGDCA101 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- To make student understand various components of computer and their working.
- Learn MS-Office and its components.
- To make student understand about Internet and Internet services.

By the end of the course a student is expected to:

- Learn how computer works and the importance of various components of computers.
- Understand about how Internet works.
- Select particular configuration of computer necessary for the application.

Syllabus

Unit I

Computer Fundamentals: Introduction to Computers: Characteristics and Limitations of Computers, Evolutions of Computers, Classification of Computers, Computer Languages, Types of software, Structured Programming Concepts.

Basic Computer Organization: Units of a computer, CPU, ALU, Memory Hierarchy, Registers, I/O devices, Mother Board.

Unit II

Word Processing: Introduction to MS-Word, Creating & Editing Text: Paragraph Formatting, Page Formatting, Template, Page, Views, Table; Advanced Features: Bookmark, Mail Merge, Macros.

Unit III

Spread Sheets: Introduction to MS-Excel, Creating & Editing Worksheet, Formatting data, Formulas and Functions, Creating Charts, Pivot Tables.

Power Point Presentations: Creating, Manipulating & Enhancing Slides, Organizational Charts, Animations & Sounds, Inserting Animated Pictures

Unit IV

Internet Basics: History of Internet, Web Browsers, Web Servers, Hypertext Transfer Protocol, Internet Protocols Addressing, Internet Connection Types, How Internet Works, ISPs, Search Engines, Emails and Its Working, Internet Security, Uses of Internet, Computer Networks and their

advantages, Types of Computer Network, Network Topologies, Basics of Transmission Media; Cloud Computing Basics: Overview, Applications, Intranets and the Cloud; Benefits, Limitations and Security Concerns.

Text and Reference Books:

- Satish Jain, Kratika, M. Geetha, "MS Office", BPB Publications, 2010.
- ITL Education Solutions Limited, "Introduction to Computer Science", Pearson Education, 2nd Edition 2012.
- P. K. Sinha, "Computer Fundamentals", 6th edition, 2003
- Tony Feldman,"Introduction to Digital Media", Routledge; 1 edition, 1996.
- Bartee, Thomas C, "Digital Computer Fundamentals", McGraw-Hill Inc., 6th Edition, 1984

PGDCA102:Computer Programming Using C

General Course Information:

Course Code: PGDCA102 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are to make students to understand programming language, concepts of structured programming, Control structures, Stepwise refinement, Functions, Arrays, and Pointers etc. The main emphasis of the course will be on problem solving aspect i.e. developing proper algorithms.

By the end of the course a student is expected to:

- Use the various constructs of a programming language.
- Write program in 'C' language to solve a problem.
- Implement the algorithms in 'C' language.
- Handle Files in 'C'

Syllabus

Unit I

Programming process: Problem definition, Algorithm development, Flowchart, Program Coding, compilation, debugging,testing and execution, Types of errors.

C Programming Fundamentals: Identifiers and keywords, Structure of C Program data types, input and output, type conversion.

Unit II

Operators &Expressions: Arithmetic, unary, logical and relational operators, assignment operator, Bit-wise, conditional operator, library functions.

Control statements: Decision making using if, if-else, Nested IF,Else If Ladder switch, break, continue statement and goto Statement, looping using for, while and do-while statements, nested loops.

Unit III

Functions: Library functions, Defining & accessing User defined functions, function prototype and passing arguments to a function, recursion versus iteration. Macro vs function.

Arrays: Definition, accessing elements, initialization, passing to functions, multi-dimensional arrays, Strings & operations of Strings, String Handling through Built-in and User Defined Functions. Pointers declaration, assignment, Pointer Arithmetic,passing pointer to functions, pointer arrays,Dynamic Memory Allocation.

Unit IV

Structure and Union: Defining and Initializing Structure, accessing members, nested structures, pointer to structures, self-referential structures, Unions: Introduction to Unions and its Utilities.
File Handling and Storage classes: automatic, register, external and static variables; Opening and Closing file in C,Modes of File,Reading and Writing data to a file.

Text and Reference Books:

- E.Balaguruswamy, "Programming in C",TMH.
- Y.Kanetkar, "Let Us C" BPB Publication.
- Byron Gottfried, "Programming with C", Schaum's outline series" TMH.

PGDCA103: Operating Systems

General Course Information:

Course Code:PGDCA103 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

About the Course and its Objectives & Outcomes:

The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design.

By the end of the course a student is expected to:

- Exhibit familiarity with the fundamental concepts of operating systems.
- Exhibit competence in recognizing operating systems features and issues.

Syllabus

Unit I

Introductory Concepts: Operating systems functions and characteristics, operating system structure,operating system services, system calls, system programs. Types of Operating system: Batch operating system, Time-sharing operating system, Distributed operating system, Real time systems

Process Management: Process concept, Process States, Process Control Block, Cooperating processes.

Unit II

CPU scheduling: Levels of Scheduling, Scheduling criteria, Comparative study of scheduling algorithms, Multiple processor scheduling.

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Monitors, Inter-process Communications.

Unit III

Deadlock: System model, Deadlock characterization, Methods for handling Deadlocks: Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from Deadlock.

Storage Management: Storage allocation methods: Single contiguous allocation, Multiple contiguous allocation, Paging; Segmentation combination of Paging and Segmentation, Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.

Unit – IV

Device and file management: Disk scheduling, Disk structure, Disk management, File Systems: Functions of the system, File access and allocation methods, Directory Systems: Structured Organizations, directory and file protection mechanisms.
Case Studies: Comparative study of WINDOW, UNIX, ANDROID & LINUX system.

Text and References Books:

- D.M.Dhamdhere, "Operating systems- A Concept based Approach", 2nd Edition.TMH
- Silberschatz, Galvin and Gagne, "Operating System Concepts", Sixth Edition, Wiley India Pvt. Ltd.
- Andrew S.Tanenbaum,"Modern Operating Systems", Second Edition, Pearson Education.
- Harvey M. Deital, "Operating Systems", Third Edition, PearsonEducation.
- Godbole, A.S., "Operating Systems", Tata McGraw-Hill Publishing Company, New Delhi.

PGDCA104: Database Management Systems

General Course Information:

Course Code: PGDCA104 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- To provide comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages, and a survey of implementation techniques applied in modern DBMS.
- To provide practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management.
- To develop skills that is appropriate for Database Administrators, Database Application Developers, Database Specialists, and DBMS developers.

By the end of the course a student is expected to be familiar with:

- The basic concepts and appreciate the applications of database systems.
- The basics of SQL and construct queries using SQL.
- A relational database system theory and be able to design database based on relational data model.

Syllabus

Unit I

Overview: File Systems vs. DBMS, Characteristics of the Data Base Approach, Database users, Advantages and Disadvantages of a DBMS, Responsibility of Database Administrator.

Data Base Systems Concepts and Architecture: Data Models, Schemas and Instances, DBMS architecture and various views of Data, Data Independence, Database languages.

Unit II

Entity Relationship Model: Basic Concepts-Entity, Attributes, Types of Attributes, Entity set and Keys, Relationships-Relationship set, Degree of Relationship, Roles and Structural Constraints, E-R Diagrams, Reduction of an E-R Diagram to Tables, Binary Representation and Cardinality, Participation Constraints

Unit III

Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

Unit IV

SQL: Introduction to SQL, Data Types in SQL, Common Commands in SQL- Select, Insert, Update and Delete, views in SQL; Relational Database Design: Functional Dependencies, Decomposition, Desirable properties of decomposition, Normal Forms (1 NF, 2 NF, 3 NF and BCNF).

Text and Reference Books:

- Elmasri&Navathe,"Fundamentals of Database Systems", 3rd Edition, Addison Wesley, New Delhi.
- R.Pannerselvam,"Database Management Systems",2nd Edition, PHI Learning Pvt. Ltd., New Delhi, 2011
- Bipin C. Desai,"An Introduction to Database System", Galgotia Publication, New Delhi
- Korth and Silberschatz ,"Database System Concept", 4th Edition, McGraw Hill International Edition

PGDCA105: Web Technologies

General Course Information:

Course Code: PGDCA105 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- Learn HTML and design various web pages.
- Learn tags and its uses in web designing process with HTML.

By the end of the course a student is expected to be familiar with:

- Become skilled at Web Designing Complete Process.
- Make Web Pages using tags in HTML.
- Get proficient in using HTML.

Syllabus

Unit I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools.

Unit II

Web Publishing: Hosting your Site; Internet Service Provider; Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names; Creating a Website; Website and its Categories.

Unit III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML Document structure; HTML command Tags; Creating Links; Heading tags; Text styles; Text Structuring; Text colors and Background colors; Text Formatting; Page Layouts.

Unit IV

Images; Inserting Graphics; Images as Hyperlinks; Ordered and Unordered lists; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes.

Text and Reference Books:

- Raj Kamal, “Internet and Web Technologies”, Tata McGraw-Hill.
- Ramesh Bangia, “Multimedia and Web Technology”, Firewall Media.
- Thomas A. Powell, “Web Design: The Complete Reference”, 3-edition, Tata McGraw-Hill.
- Wendy Willard, “HTML: A Beginners Guide”, Tata McGraw-Hill.
- Deitel and Goldberg, “Internet and World Wide Web, How to Program”, PHI.

PGDCA106: Software Laboratory –I
Programming in C

General Course Information:

Course Code: PGDCA106 *Course Credits: 2 Type: Compulsory Contact Hours: 4 hours/week Mode: Experimental Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 20; external: 80)** An internal practical examination is conducted by the course coordinator. The end semester practical examination is conducted jointly by external and internal examiners. External examiner is appointed by the COE of the university from the panel of examiners approved by BOSR of the Department of Computer Science and Engineering, Hisar and the internal examiner is appointed by the Chairperson of the Department.

Pre-requisites:
Students are expected to have the strong theoretical concepts and computer fundamentals as well as capability to develop logic, to write algorithm and draw flowchart.

The objectives of this lab.course are to:
- Provide a way to interact and understand the way a computer works.
- Learn how to input data for a given problem from keyboard and obtain outputs from monitor.

By the end of the course a student is expected to be able to:
- Write code for a given problem in „C" language.
- Present results in an informative way

Students are given eight to ten laboratory assignments with soft and hard deadlines. The lab assignments are evenly spread over the semester. Every student is required to prepare a file of laboratory experiments done

List of Laboratory Assignments:
1. Write a program to find ASCII value of a character.
2. Write a program to swap two numbers without using third variable.
3. Write a program to check whether a number is Even or Odd.
4. Write a program to find largest among three numbers without using if.
5. Write a program to display Fibonacci sequence.
6. Write a program to print first ten prime numbers.
7. Write a program to check number is Armstrong or not using while.
8. Write a program to design a simple calculator using switch.
9. Write a program to find largest and smallest using global declaration.
10. Write a program to find factorial of a Number using recursion.
11. Write a program to reverse a String.
12. Write a program to find number is int or float.
13. Write a program to find largest and smallest element of an array.
14. Write a program to find addition of two matrices.
15. Write a program to find Multiplication of two Matrices.

16. Write a program to check matrix is sparse or not.
17. Write a program to perform concatenation of strings using pointers.
18. Write a program to implement structures.
19. Write a program to add two numbers using pointers.
20. Write a program to read and write data in a file.

PGDCA107: Software Laboratory –II
HTML and MS-Office

General Course Information:

Course Code: PGDCA106 *Course Credits: 2 Type: Compulsory Contact Hours: 4 hours/week Mode: Experimental Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 20; external: 80)** An internal practical examination is conducted by the course coordinator. The end semester practical examination is conducted jointly by external and internal examiners. External examiner is appointed by the COE of the university from the panel of examiners approved by BOSR of the Department of Computer Science and Engineering, Hisar and the internal examiner is appointed by the Chairperson of the Department.

Pre-requisites:
Students are expected to have basic knowledge of computers.

The objectives of this lab.course are to:
- To design web pages using different tags in HTML.
- To understand the Office Packages.
- To have hands on knowledge of MS Word and MS Excel.
- To have practical knowledge of MS PowerPoint.

By the end of the course a student is expected to be able:
- Use MS-Word to create resume, letters, tables etc.
- Use MS-Excel to store numerical data and perform calculations on it.
- Use MS-PowerPoint to create professional presentation.
- Design web pages of web sites using HTML language.

Students are given ten or more laboratory assignments with soft and hard deadlines. The lab assignments are evenly spread over the semester. Every student is required to prepare a file of laboratory experiments done.

List of Laboratory Assignments:
1. Write a HTML code to show body, title, text formatting, color and background color tag.
2. Write a program in HTML to create a web page to show comment and H1-----H6 tags.
3. Write a HTML code to illustrate the usage of the following
   a. Ordered List
   b. Unordered List
   c. Definition List
4. Write a program in HTML to show map of India.
5. Write a HTML code to display your education details in a tabular format.
6. Write a HTML code to create a Homepage having three links: About Us, Our Services and Contact Us. Create separate web pages for the three links.

7. Write a HTML code to create a Registration Form. On submitting the form, the user should get navigated to a profile page.
8. Write a program in HTML to create a webpage with four frames.
9. Create a class timetable using table option in MS- Word.
10. Using MS-Word, create personal letter and company letter.
11. Use mail merge to create a form letter.
12. Make your resume in MS-Word.
13. Create a presentation in MS PowerPoint on any topic of your choice with animation and transition effects.
14. Enter the data given below into a worksheet.

	A	B	C	D	E
1	**Stationery Supplies Ltd**				
2					
3	**Date**	**SalesPerson**	**Item**	**Receipt No**	**Amount**
4	21-Nov	Carl	Toys	1238	1,782.10
5	26-Nov	Carl	Stationery	1255	4,853.55
6	26-Nov	Carl	Toys	1395	51.35
7				**Carl's Total**	
8	21-Nov	John	Cards	1141	91.15
9	24-Nov	John	Books	1982	442.60
10	21-Nov	John	Toys	1885	561.50
11	26-Nov	John	Toys	1875	62.75
12				**John's Total**	
13	22-Nov	Judy	Books	1032	234.50
14	26-Nov	Judy	Sports goods	1920	472.60
15				**Judy's Total**	
16	25-Nov	Mary	Toys	1774	364.15
17				**Mary's Total**	
18	22-Nov	Susan	Electronics	1160	52.95
19	23-Nov	Susan	Cards	1075	81.60
20	23-Nov	Susan	Others	1745	132.95
21	24-Nov	Susan	Sports goods	1662	2,580.10
22				**Susan's Total**	
23					
24				**Grand Total**	

(i). Calculate the totals for each salesperson and get the grand total;
(ii). Format the worksheet as follows:
Make all the Totals bold, two decimal places, comma, center the title across columns A-E and make it size 16, bold and Italic.
(iii). Put a double border round the whole table and a single line border inside the table.
(iv). Save the worksheet as **Stationery Analysis**.

15. Using the information given in the table below, calculate the amount and total amount payable by the company to the employees.

	A	B	C	D	E
1	**Services Company Ltd**				

2	**Overtime Details**				
3	**Date**	**Name**	**Hours Worked**	**Rate**	**Amount**
4	26-Nov	Kennedy	5	70	
5	26-Nov	Kennedy	5	100	
6	26-Nov	Mary	5	100	
7	26-Nov	Lewis	4	100	
8	30-Nov	Judy	3	100	
9	30-Nov	Kennedy	6	70	
10	30-Nov	Lewis	5	100	
11	30-Nov	Kennedy	4	70	
12	30-Nov	Judy	5	100	
13	30-Nov	Lewis	5	100	
14	02-Dec	Judy	4	70	
15			**Total Amount**		

PGDCA108 Seminar

General Course Information:

Course Code: PGDCA108 *Course Credits: 1 Type: Compulsory Contact Hours: 2 hours/week Mode: Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 100)** An internal examination is conducted by the assigned teacher on regular basis in lab and based evaluation is done by the teacher.

The objectives of this Seminar course are to:

- Understanding of the basics of the application of the various models of verbal and non-verbal communication in the social and professional sphere
- Develop the following skills in the students-
  - Communication Skills
  - Presentation Skills
  - Active Listening etc.

By the end of the course a student is expected to be able:

- To understanding the importance of intonation, word and sentence stress for improving communicative competence, identifying and overcoming problem sounds.
- To establish a repo with the audience.
- To present his/her ideas clearly and confidently.
- To address the queries from the audience.

General Guidelines:

- Students are required to prepare a presentation.
- The content of presentation can be on any topic from the core subject.
- Students are required to submit hard as well as soft copy of the presentation to the concerned teacher.

PGDCA201: Data Structures and Algorithms

General Course Information:

Course Code: PGDCA201 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

Pre-requisites:
Students are expected to have knowledge of programming in a standard programming language like C.

About the Course and its Objectives & Outcomes:
The objectives of this course are to

- Achieve an understanding of fundamental data structures, which allow one to store collections of data with fast updates and queries
- Study theoretical analysis, implementation and application of data structures, and
- Learn tradeoffs between different implementations of these abstractions.

By the end of the course a student is expected to:

- Design algorithms for various computing problems.
- Analyze the time and space complexity of algorithms.
- Efficiently implement your solution using programming language C.

Syllabus

Unit I

Introduction: Data Structures Definition and its types, Data Structure operations, Static and dynamic memory storage,Algorithms complexity and time-space tradeoff, Big-O notation.
Strings: Introduction, storing strings, String operations, Pattern matching algorithms.

Unit II

Arrays: one-dimensional arrays,matrices, sparse matrices, multi-dimensional arrays, operations on arrays, Linear search, Binary search, Insertion sort, selection sort, Bubble sort, Merge sort.
Linked List: Array vs linked list, Types (singly, doubly, singly circular, header, doubly circular,), Operations on Lists – create, insert, delete, search, Applications of linked lists.

Unit III

Stack: Definition, Array implementation of stacks, Linked implementation of stacks, Applications of Stacks: Infix, Postfix and prefix expression, conversions and evaluation of expressions, Recursion, Quick Sort.
Queue: Definition, Array implementation of queues, Linked implementation of queues, Circular queues, Priority queues, Double-ended queues, Applications of queue.

Unit IV

Trees: Binary Trees and their properties, Linked and static Representation of binary trees, Complete Binary Tree, Threaded Binary tree, Different tree traversal algorithms, Binary Search Tree (create, delete, search, insert, display), Heap Sort and its complexity analysis, Introduction to AVL Trees and Balanced multi-way search trees.
Graph: Definition, Array and linked representation of graphs, Graph Traversal (BFS and DFS), Adjacency matrix and adjacency lists, path matrix, Finding Shortest Path - Warshall's Algorithm.

Text and Reference Books:

- Seymour Lipschutz, “Data Structures”, Tata McGraw- Hill Publishing Company Limited, Schaum’s Outlines, New Delhi.
- YedidyanLangsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, “Data Structures Using C”, Pearson Education., New Delhi.
- BalaGuruswamy, “Data Structures Using C”, TMH.
- Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison- Wesley.

PGDCA202: Computer Networks

General Course Information:

Course Code: PGDCA202 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

Prerequisite:
Student is required to have the knowledge of Data representation, Digital and Control Logic, Memory Hierarchy, Input/ output devices and overall system design.

About the Course and its Objectives & Outcomes:
The objectives of this course are:

- To introduce to various types of Networks. Networks relates to the Communication among various Gadgets and Networking devices.
- To understand the OSI model for Networks that defines collection of protocols for the related communication.
- To learn various wired and wireless connections for communication.

By the end of the course a student is expected to:

- Able to understand the nature of computer network.
- Able to identify the type of Network in the work environment and identify the protocols at various layers.
- Define OSI reference models and its layers.

Syllabus

Unit I

Introduction: Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices: Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model.

Unit II

OSI Reference Model: Physical, Data Link, Network, Transport, Session, Presentation and Application layer; Advantages and Disadvantages of OSI model; Example Networks: Internet, ATM.

Unit III

Network hardware components: Connectors, Transceivers, Network Interface Cards, Hubs, Switches, Repeater, Bridges, Routers, Gateways; Transmission media: Guided- Twisted, Co-axial, Fiber –optic cable, Unguided-Radiowaves, Microwaves, Infrared Transmission, Wired versus Wireless Networks.

Unit IV

Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Communication Satellites; Switching and Multiplexing; Dialup Networking, Broadband Connection, Wireless Connection.

Text and Reference Books:

- Andrew s. Tanenbaum, “Computer Networks”, PHI.
- Fred Halsall, “Data Communications, Computer Networks and Open Systems”, fourth edition, Addison Wesley.
- Behrouz, Forouzan, “Introduction to Data Communications and Networking”, Tata Mc-Graw Hill.
- William Stallings, “Data and Computer Communications”, fifth edition, PHI.

PGDCA203: Object Oriented Systems and C++

General Course Information:

Course Code: PGDCA203 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

Pre-requisites: Basic knowledge of C language concepts like Data-Types, Loops, Array, Structure etc.

About the Course and its Objectives & Outcomes:

The objectives of this course are to:

- Understand the advanced programming concepts of OOPS.
- Develop efficient applications with greater ease using the concepts like Abstraction, Encapsulation, Polymorphism and Inheritance.

By the end of the course a student is expected to:

- Design and Develop different computer software applications.
- Implementation of various algorithms in programming languages for research purpose

Syllabus

Unit 1

Introduction to object oriented programming: Procedural vs Object oriented programming Characteristics of OOP; Classes& Object, Data encapsulation and Abstraction, Polymorphism, Inheritance, Dynamic Binding and message passing, OOPs Application, Structure of C++ Program ,Data types ,Variables, Operators, Namespaces, Enums, Type Conversion, Control Statements Arrays, Strings, Structure, Pointers.

Unit II

Introduction to Class: Struct vs. Classes, Class Definition, Classes and Objects, Access Specifiers: Private, Public and Protected, Member functions of the class, Constructor and Destructor, Parameterized Constructor, Copy Constructors. Inheritance: Reusability, Types of Inheritance: Single inheritance, Multiple, Multilevel, Hybrid Inheritance, Public, Private, and Protected Derivations, Using derived class, Constructor and destructor in derived class, Object initialization and conversion, Nested classes (Container classes), Virtual Inheritance and Virtual base class.

Unit III

Polymorphism and Exception Handling: Function Overloading, Static Class Members, Static Member Functions, Friend Functions, Operator Overloading: Unary and Binary Operator Overloading. Abstract class, Virtual function, Pure virtual function, Overloading vs. Overriding. Memory management: new, delete, object Creation at Run Time, This Pointer. Exception handling: Throwing, Catching, Re-throwing an exception, specifying exceptions, processing unexpected exceptions, Exceptions when handling exceptions, resource capture and release.

UNIT IV

Templates and Files: Introduction, Class templates and Function templates, Overloading of template function, namespaces. Introduction to STL: Standard Template Library: benefits of STL, containers, adapters, iterator, vector, list. Working with files: C++ streams, C++ stream classes, creating, opening, closing and deleting files, file pointers and their manipulators, updating file, random access to file, Error handling during file operations.

Text and Reference Books:

- Herbert Schildt, "C++ - The Complete Reference", Tata McGraw Hill Publications.
- E. Balaguruswamy, "C++", Tata McGraw Hill Publications.
- E. Balaguruswamy, "Object Oriented Programming and C++", TMH.
- Shah and Thakker, "Programming in C++", ISTE/EXCEL.
- Johnston, "C++ Programming Today", PHI.
- Olshevsky, "Revolutionary Guide to Object Oriented Programming Using C++", SPD/WROX.
- R.Rajaram,"Object Oriented Programming and C++", New Age International.

PGDCA204: Computer Organization

General Course Information:

Course Code: PGDCA204 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

Prerequisites:
Students are expected have the elementary knowledge about computers.

About the course objectives and outcomes:
The objectives of this course are to:

- Basic understanding of computer organization: roles of processors,
- Understanding the concept of information Representation.
- Understanding arithmetic and logical operations with integer operands.
- To understand digital, binary, combinational, sequential logic.

By the end of the course a student is expected to be able:

- To solve basic binary math operations using the computer.
- To demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target computer.
- To apply knowledge of the processor's internal registers.

Syllabus

Unit I

Information Representation: Number Systems, Binary Arithmetic Operations, Fixed-point and Floating point representation of numbers, BCD, ASCII, EBCDIC, Grey Code.

Unit II

Binary Logic: Boolean Algebra, Duality Principal, Boolean Theorems, Boolean Functions Truth Tables, De Morgan's Law, Simplification of Boolean Functions using Venn Diagram, Karnaugh Maps, Digital Logic: Logic Gates -AND, OR, NOT, Universal Gates - NAND, NOR, others- XOR, XNOR.

Unit III

Combinational Logic: Design Procedure, Adders, Subtractors, Encoders, Decoders, Multiplexers and De-multiplexers. Sequential Logic: Flip-flops, Registers and Counters.

Unit IV

Basic Computer Organization: Instruction Code, Computer Registers, Computer instructions, Timing and control, Instruction Cycle.

CPU organization: General Register Organization, Stack Organization, Instruction Formats, Addressing Modes.

Text and References Books:

- Mano, M. Morris,"Digital Logic and Computer Design", Prentice Hall of India Pvt. Ltd.
- V. Rajaraman, T. Radhakrishnan,"An Introduction to Digital Computer Design", PrenticeHall of India Pvt. Ltd.
- Mano, M. Morris,"Computer System Architecture", Prentice Hall of India Pvt. Ltd.
- Andrew S. Tanenbaum,"Structured Computer Organization", Prentice Hall of India Pvt.Ltd.

PGDCA205: Software Engineering

General Course Information:

Course Code: PGDCA205 Course Credits: 4 Type: Compulsory Contact Hours: 4 hours/week Mode: Lectures Exam Duration: 3hours	**Course Assessment Methods (internal: 20; external: 80)** Two minor examinations each of 15 marks, Class Performance measured through percentage of lectures attended (2 marks) Assignment and quiz (3 marks), and end semester examination of 80 marks. The syllabus is divided into four units. For the end semester examination, nine questions are to be set by the examiner. Question number one is compulsory and contains eight short answer questions covering entire syllabus. Rest eight questions are set by giving two questions from each of the unit of the syllabus. A candidate is required to attempt any of four questions selecting at least one from each of the four units. All questions carry equal marks.

Pre-requisites:
Students are expected to have knowledge of algorithms, flow charts and at least one programming language.

About the Course and its Objectives & Outcomes:
The objectives of this course are to:

- Introduce students to software development life cycle and models for developing and effective and efficient software
- Identify software requirements for manual or automated real-world systems
- Compare and contrast software process models and software development methodologies
- Moreover, student will learn the skill of software requirement specification and software quality assurance techniques

By the end of the course a student is expected to:

- Describe the software development life cycle as well as describing the various software development model and understand the advantages and disadvantages of each model;
- Illustrate the software requirement specification, Effort estimation
- Understand the use of model checking and be able to use it effectively.

Syllabus

Unit I

Introduction: Program vs. Software, Software Engineering paradigms, Software Crisis – problem and causes.
Phases in Software development: Requirement, Analysis, Software Design, Coding, Testing, Maintenance.
Software Development Process Models: Waterfall, Prototype, Evolutionary and Spiral models.

Unit II

Software Requirement Analysis and Specifications: Feasibility Study Software Requirements, Need for SRS, Characteristics of an SRS, Components of an SRS, Structure of a requirements

document, validation and metrics, Problem Analysis, Data Flow Diagram, Data Dictionary, Decision table, Decision trees.

Unit III

Software Project Planning: Process Planning, Effort estimation, COCOMO model, Project scheduling and Staffing, team structure, Software configuration management, Quality assurance plans, Risk Management, Project monitoring plans.

Software Implementation and Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics.

Unit IV

Testing: Testing fundamentals, Error, Fault, and Failure, Test Oracle, Test Case and Test Criteria, Psychology of testing, Black Box Testing, Boundary value analysis, Equivalence Class Partitioning, Decision Table based testing, Cause effect graphing, White box testing , Control flow based criteria, level of testing, Unit testing, Integration testing, System testing, Validation testing, alpha, beta, and Acceptance testing.

Text and Reference Books:

- Pressman R. S., “Software Engineering – A Practitioner’s Approach”, Tata McGraw Hill.
- Jalote P., “An Integrated approach to Software Engineering”, Narosa.
- Sommerville, “Software Engineering”, Pearson Education.
- Fairley R., “Software Engineering Concepts”, Tata McGraw Hill.

PGDCA206: Software Laboratory –III
Data structure implemented in C/C++

General Course Information:

Course Code: PGDCA206 *Course Credits: 2 Type: Compulsory Contact Hours: 4 hours/week Mode: Experimental Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 20; external: 80)** An internal practical examination is conducted by the course coordinator. The end semester practical examination is conducted jointly by external and internal examiners. External examiner is appointed by the COE of the university from the panel of examiners approved by BOSR of the Department of Computer Science and Engineering, Hisar and the internal examiner is appointed by the Chairperson of the Department.

Pre-requisites:
Students are expected to have the strong theoretical concepts and computer fundamentals as well as are expected to be proficient in programming language like "C or C++".

The objectives of this lab.course are to:
- Learn how to implement data structure in a programming language.
- Make the students familiar with various operations on data.
- Learn the students how to deal with memory management.

By the end of the course a student is expected to be able to:
- Make a differentiation in abstract data type and dynamic data type.
- Model real world data aggregations using different data structures.

Students are given ten or more laboratory assignments with soft and hard deadlines. The lab assignments are evenly spread over the semester. Every student is required to prepare a file of laboratory experiments done.

List of Laboratory Assignments:
1. Write a program to insert an element in an array.
2. Write a program to delete an element from an array.
3. Write a program for Pattern Matching Algorithm.
4. Write a program for Bubble Sort/ Selection Sort/ Insertion Sort.
5. Write a program for Linear Search/ Binary search.
6. Write a program to insert a node in linked list at beginning, end, after a given node, before a given node.
7. Write a program to delete the starting node, last node or a given node from a linked list.
8. Write a program to implement push and pop operation in a stack using array.
9. Write a program to implement push and pop operation in stack using Linked List.
10. Write a program for Quick Sort.
11. Write a program to insert and delete an element in Queue using array.
12. Write a program to insert and delete an element in Queue using Linked List.
13. Write a program for tree traversal.

PGDCA207: Software Laboratory –IV
Programming in C++

General Course Information:

Course Code: PGDCA206 *Course Credits: 2 Type: Compulsory Contact Hours: 4 hours/week Mode: Experimental Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 20; external: 80)** An internal practical examination is conducted by the course coordinator. The end semester practical examination is conducted jointly by external and internal examiners. External examiner is appointed by the COE of the university from the panel of examiners approved by BOSR of the Department of Computer Science and Engineering, Hisar and the internal examiner is appointed by the Chairperson of the Department.

Pre-requisites:
Students are expected to have basic concepts (theoretical) of object oriented language.
The objectives of this lab.course are to:
- Learn how to input data for a given problem from keyboard and obtain outputs from monitor
- Extend the programming capability of students using object oriented language.

By the end of the course a student is expected to be able to:
- Write code for a given problem in C++.
- Present results in an informative way
- Understand the importance of concepts of object oriented approaches in software development.

Students are given ten or more laboratory assignments with soft and hard deadlines. The lab assignments are evenly spread over the semester. Every student is required to prepare a file of laboratory experiments done

List of Laboratory Assignments:
1. Write a Write a program to find simple interest using default arguments.
2. Write a program to find area of circle using inline function.
3. Write a program to find volume of cylinder, cube and cuboid using function overloading.
4. Write a program to show static data member and static function.
5. Write a program to enter name, age and salary of 5 employees using array of objects.
6. Write a program to swap private data member of two different classes using friend function.
7. Write a program to find maximum of two numbers belonging to two different classes using friend function.
8. Write a program to add two complex numbers using constructor.
9. Write a program to show copy constructor.
10. Write a program to show destructor.
11. Write a program to show single inheritance.
12. Write a program to show multilevel inheritance.
13. Write a program to call a member function of a class using a non-member function.
14. Write a program to show overloading of binary operator.

15. Write a program to show use of this pointer.
16. Write a program using virtual functions.
17. Write a program to show concatenation of strings using operator overloading.
18. Write a program to show the use of template.
19. Write a program to read data from two files simultaneously.

PGDCA208: Seminar

General Course Information:

Course Code: PGDCA208 *Course Credits: 1 Type: Compulsory Contact Hours: 2 hours/week Mode: Lab. *In lab work one credit is equivalent to two hours	**Course Assessment Methods (internal: 100)** An internal examination is conducted by the assigned teacher on regular basis in lab and based evaluation is done by the teacher.

The objectives of this Seminar course are to:

- Understanding of the basics of the application of the various models of verbal and non-verbal communication in the social and professional sphere
- Develop the following skills in the students-
  - Communication Skills
  - Presentation Skills
  - Active Listening etc.

By the end of the course a student is expected to be able:

- To understanding the importance of intonation, word and sentence stress for improving communicative competence, identifying and overcoming problem sounds.
- To establish a repo with the audience.
- To present his/her ideas clearly and confidently.
- To address the queries from the audience.

General Guidelines:

- Students are required to prepare a presentation.
- The content of presentation can be on any topic other than the core subjects. However, it should be recent and relevant.
- Students are required to submit hard as well as soft copy of the presentation to the concerned teacher.

Indira Gandhi University, Meerpur
Rewari

Syllabus for BCA

Session –w.e.f. 2017-2018

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – Ist YEAR(Ist and 2nd SEMESTERS)

w.e.f. 2017-18

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

Paper No.	Title of Paper	Max. Marks		Exam Duration
		External	**Internal**	**3 Hours**
BCA-101	Computer & Programming Fundamentals	**80**	**20**	**3 Hours**
BCA-102	PC Software	**80**	**20**	**3 Hours**
BCA-103	Mathematics	**80**	**20**	**3 Hours**
BCA-104	Logical Organization of Computer-I	**80**	**20**	**3 Hours**
BCA-105	Practical software Lab – Based on paper BCA-102 i.e Word, Excel and Power point	**80**	**20**	**3 Hours**

Paper No.	Title of Paper	Max. Marks		Exam Duration
		External	**Internal**	**3 Hours**
BCA-106	'C' Programming	**80**	**20**	**3 Hours**
BCA-107	Logical Organization of Computer-II	**80**	**20**	**3 Hours**
BCA-108	Mathematical Foundations of Computer Science	**80**	**20**	**3 Hours**
BCA-109	Structured System Analysis and Design	**80**	**20**	**3 Hours**
BCA-110	Practical software Lab – Based on paper BCA-106, i.e.'C' Programming	**80**	**20**	**3 Hours**

BCA-101: COMPUTER & PROGRAMMING FUNDAMENTALS

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Computer Fundamentals: Generations of Computers, Definition, Block Diagram along with its components, characteristics & classification of computers, Limitations of Computers, Human-Being VS Computer, Applications of computers in various fields.

Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, Cache Memory, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, optical disks i.e. CD, DVD, virtual memory.

UNIT-II

Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.

Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.

Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software.

UNIT-III

Computer Languages: Analogy with natural language, machine language, assembly language, high-level languages, forth generation languages, compiler, interpreter, assembler, Linker, Loader , characteristics of a good programming language, Planning the Computer Program:

Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming, Advantages and disadvantages of Structured programming.

UNIT-IV

Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, Modes of data transmission, Forms of data transmission, Transmission channels(media), Introduction to internet and its uses, Applications of internet, Hardware and Software requirements for internet, Intranet, Applications of intranet.

SUGGESTED READINGS

1) Satinder Bal Gupta, Amit Singla: Computer Fundamentals & Programming in C, Shree Mahavir Book (Publishers), Delhi.
2) Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
3) Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
4) Rajaraman, V., Fundamentals of Computers, PHI
5) Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.

BCA-102: PC SOFTWARE

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

UNIT - II

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT - III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

UNIT - IV

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

SUGGESTED READINGS

1) Microsoft Office – Complete Reference – BPB Publication
2) Satinder Bal Gupta, Introductory Concepts of Information Technology, Shree Mahavir Book(Publishers), Delhi
3) Learn Microsoft Office – Russell A. Stultz – BPB Publication
4) Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
5) Nelson, S L and Kelly, J (2002). Office XP: The Complete Reference. Tata McGraw-Hill.

BCA-103: MATHEMATICS

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT I

SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, Solving a system of linear equations.

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, solving system of linear equation Cramer's Rule.

UNIT II

RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity of a function at a Point, Continuity Over an Interval, Sum, product and quotient of continuous functions, Intermediate Value Theorem, Type of Discontinuities.

UNIT III

DIFFERENTIATION: Derivative of a function, Derivatives of Sum, Differences, Product & Quotient of functions, Derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions, Logarithmic Differentiation, Chain Rule and differentiation by substitution.

UNIT IV

INTEGRATION: Indefinite Integrals, Methods of Integration by Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for simple and Trigonometric Functions, Definite Integral as Limit of Sum, Fundamental Theorem of Integral Calculus, Evaluation of definite integrals by substitution, using properties of definite integral,

SUGGESTED READINGS

1) Satinder Bal Gupta: Discrete Mathematics and Structures, University Science Press, Delhi.
2) C.L.Liu: Elements of Discrete Mathematics, McGraw Hill.
3) Lipschutz, Seymour: Discrete Mathematics, Schaum's Series
4) Trembley, J.P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
5) Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.
6) Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
7) Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.

BCA-104 : LOGICAL ORGANIZATION OF COMPUTER-I

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floatingpoint representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode

UNIT - II

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn Diagram, Karnaugh Maps.

UNIT - III

Digital Logic: Introduction to digital signals, Basic Gates – AND, OR, NOT, Universal Gates and their implementation – NAND, NOR, Other Gates – XOR, XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational Logic – Characteristics, Design Procedures, analysis procedures, Multilevel NAND and NOR circuits.

UNIT - IV

Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Parallel binary adder/subtractor, Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.

SUGGESTED READINGS

1) Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.
2) M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
3) V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4) Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5) Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA-105 : Practical- Software lab

(Based on paper BCA-102, PC Software)

BCA-106 : 'C' PROGRAMMING

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression:
Arithmetic, relational, logical, bitwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

UNIT-II

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement.
Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement, Nested loops.

UNIT-III

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions viz. getch(), getche(), getchar(), gets(), output functions viz., putch(), putchar(), puts(), string manipulation functions.
User defined functions: Introduction/Definition, prototype, Local and global variables, passing parameters, recursion.

UNIT-IV

Arrays, strings and pointers: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. String constant and variables, Declaration and initialization of string, Input/output of string data, Introduction to pointers.
Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.
Algorithm development, Flowcharting and Development of efficient program in C.

SUGGESTED READINGS

1) Satinder Bal Gupta, Amit Singla: Computer Fundamentals & Programming in C, Shree Mahavir Book (Publishers), Delhi.
2) Gottfried, Byron S., Programming with C, Tata McGraw Hill
3) Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
4) Yashwant Kanetker, Let us C, BPB.
5) Rajaraman, V., Computer Programming in C, PHI.
6) Yashwant Kanetker, Working with C, BPB.

BCA-107: LOGICAL ORGANIZATION OF COMPUTER-II

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Sequential Logic: Characteristics, Flip-Flops, Clocked RS, D type, JK, T type and Master-Slave flip-flops. State table, state diagram and state equations. Flip-flop excitation tables

UNIT - II

Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO) and shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters

UNIT - III

Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers.

UNIT - IV

Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing Modes. I/O Interface, Interrupt structure, Program-controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.

SUGGESTED READINGS

1) Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation,University Science Press (Laxmi Publications), New Delhi.
2) M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt.Ltd.
3) V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4) Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5) Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA-108: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measure of Dispersion: Range, Variance and Standard Deviations, Correlation and Regression.

UNIT-II

Algorithm: Algorithms, merits and demerits, Exponentiation, How to compute fast exponentiation. Linear Search, Binary Search, "Big Oh" notation, Worst case, Advantage of logarithmic algorithms over linear algorithms, complexity.

Graph Theory: Graphs, Types of graphs, degree of vertex, sub graph, isomorphic and homeomorphic graphs, Adjacent and incidence matrices, Path Circuit ; Eulerian Hamiltonian path circuit.

UNIT-III

Tree: Trees, Minimum distance trees, Minimum weight and Minimum distance spanning trees.

Recursion: Recursively defined function.

Merge sort, Insertion sort, Bubble sort, and Decimal to Binary.

UNIT-IV

Recurrence Relations: LHRR, LHRRWCCs, DCRR. Recursive procedures.

Number Theory: Principle of Mathematical induction**,** GCD, Euclidean algorithm, Fibonacci numbers, congruences and equivalence relations, public key encryption schemes.

SUGGESTED READINGS

1) Satinder Bal Gupta: Discrete mathematics and Structures, University Science Press, Delhi.
2) Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
3) Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
4) Graybill, Introduction to Statistics, McGraw.
5) Anderson, Statistical Modelling, McGraw.
6) Babu Ram : Discrete Mathematics

BCA-109 : Structured Systems Analysis and Design

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to system, Definition and characteristics of a system, Elements of system, Types of system, System development life cycle, Role of system analyst, Analyst/user interface, System planning and initial investigation: Introduction, Bases for planning in system analysis, Sources of project requests, Initial investigation, Fact finding, Information gathering, information gathering tools, Fact analysis, Determination of feasibility.

UNIT-II

Structured analysis, Tools of structured analysis: DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured English, Pros and cons of each tool, Feasibility study: Introduction, Objective, Types, Steps in feasibility analysis, Feasibility report, Oral presentation, Cost and benefit analysis: Identification of costs and benefits, classification of costs and benefits, Methods of determining costs and benefits, Interpret results of analysis and take final action.

UNIT-III

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/Output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

UNIT-IV

System testing: Introduction, Objectives of testing, Test plan, testing techniques/Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.

SUGGESTED READINGS

1) Systems Analysis and design, E.M. AWAD Galgotia Pub.(P) Ltd.
2) Data Management and Data Structures, Loomis (PHI)
3) System Analysis and Design. Elias Awad.
4) Introductory System analysis and Design, Lee Vol. I & II

BCA-110: Practical- Software lab
(Based on paper BCA-106, C Programming)

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – 2nd YEAR(IIIrd and IVth SEMESTERS)

w.e.f. 2018-19

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

IIIrd Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-201	Introduction to Operating System	**80**	**20**	**3 Hours**
BCA-202	Data structures – i	**80**	**20**	**3 Hours**
BCA-203	Introduction to database system	**80**	**20**	**3 Hours**
BCA-204	Communication skills (English)	**80**	**20**	**3 Hours**
BCA-205	Practical software Lab – Based on paper BCA-202 & 203 using C Language and SQL	**80**	**20**	**3 Hours**

IVth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-206	Web Designing	**80**	**20**	**3 Hours**
BCA-207	Data Structures – II	**80**	**20**	**3 Hours**
BCA-208	Object Oriented Programming Using C++	**80**	**20**	**3 Hours**
BCA-209	Software Engineering	**80**	**20**	**3 Hours**
BCA-210	Practical software Lab– Based on paper BCA– 206 & 208, i.e.HTML and C++ Programming	**80**	**20**	**3 Hours**

BCA-201 : Introduction to Operating System

Time: 3 hours **External Marks: 80**
Internal Marks: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Fundamentals of Operating system: Introduction to Operating System, its need and operating System services, Early systems, Structures - Simple Batch, Multi programmed, timeshared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems.

Process Management: Process concept, Operation on processes, Cooperating Processes, Threads, and Inter-process Communication.

UNIT-II

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms : FCFS, SJF, Round Robin & Queue Algorithms.
Deadlocks: Deadlock characterization, Methods for handling deadlocks, Banker'sAlgorithm.

UNIT-III

Memory Management: Logical versus Physical address space, Swapping, Contiguous allocation, Paging, Segmentation.
Virtual Memory: Demand paging, Performance of demand paging, Page replacement, Page replacement algorithms, Thrashing.

UNIT-IV

File management: File system Structure, Allocation methods: Contiguous allocation, Linked allocation, Indexed allocation, Free space management: Bit vector, Linked list, Grouping, Counting.
Device Management: Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK.

Suggested Readings

1. Abraham Silberschatz, Peter B. Galvin, " Operating System Concepts", Addison-Wesley publishing. Co., 7th. Ed., 2004.
2. Nutt Gary, "Operating Systems", Addison Wesley Publication, 2000.
3. Andrew S. Tannenbaum, "Modern Operating Systems", Pearson Education Asia, Second Edition, 2001.
4. William Stallings, "Operating Systems, "Internals and Design Principles", 4th Edition, PH, 2001.
5. Ekta Walia, "Operating Systems Concepts", Khanna Publishes, New Delhi, 2002.

BCA – 202 : DATA STRUCTURES – I

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notataion.

Strings: Introduction, Storing strings, String operations, Pattern matching algorithms.

UNIT – II

Arrays: Introduction, Linear arrays, Representation of linear array in memory, address calculations, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, Sparse arrays.

Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

UNIT – III

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion.

Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues.

UNIT – IV

Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks.

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orient Longman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss Data Structures and Algorithm Analysis In C, Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.
5. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C", Prentice- Hall of India Pvt. Ltd., New Delhi.

BCA – 203 : INTRODUCTION TO DATABASE SYSTEM

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, advantages and disadvantages of database system, components of database system, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, DBMS users, Advantages and Disadvantages of DBMS, DBMS languages.

Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users .

UNIT – II

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances .

Data Independence – Logical and Physical Data Independence .

Classification of Database Management System, Centralized and Client Server architecture to DBMS .

Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams, abstraction and integration.

Basic Concepts of Hierarchical and Network Data Model, Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, .

UNIT – IV

Relational algebra, Relational calculus, Relational database design: Functional dependencies, Modification anomalies, Ist to 3^{rd} NFs, BCNF, 4^{th} and 5^{th} NFs, computing closures of set FDs, SQL: Data types, Basic Queries in SQL, Insert, Delete and Update Statements, Views, Query processing: General strategies of query processing, query optimization, query processor, concept of security, concurrency and recovery.

SUGGESTED READINGS

1. Satinder Bal Gupta & Aditya Mittal, "Introduction to Data Base Management System", University Science Press, New Delhi.
2. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
3. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
4. C. J. Date, "An Introduction to Database Systems", 8^{th} edition, Addison Wesley N. Delhi.

BCA-204 : COMMUNICATION SKILLS (ENGLISH)

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Basics of Communication: Communication and its various definition, features/characteristics of the communication, process of communication, communication model and theories, barrier to effective communication.

UNIT-II

Improving LSRW: introduction, verbal and nonverbal communication, listening process, group discussion, forms of oral presentation, self-presentation, dyadic communication, 5C's of communication, Developing dialogues, soft skill.

UNIT-III

Basic vocabulary: how to improve vocabulary, prefix/suffix, synonyms/antonyms, one word substitution, spellings

Developing fluency: grammar (conjunction, auxiliaries, prepositions, articles, tenses……), language games.

UNIT-IV

Proper use of Language: The Communication Skills, The effective Speech.

Effective self-presentation & facing interview: The interview process & preparing for it, The presentation skills.

SUGGESTED READINGS

1. Vik, Gilsdorf, "Business Communication", Irwin
2. K K Sinha, "Business Communication", Himalaya Publishing House / Galgoria Publication
3. Bovee, "Business Communication", Pearson ' PHI
4. Mohan, Banerjee, Business Communication, Mac million
5. Raman, Singh – Business communication – Oxford Press

BCA-205 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-202 & 203 USING C LANGUAGE AND SQL.

BCA – 206 : WEB DESIGNING

External Marks:80
Internal Marks:20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT – II

Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML.

Creating a Website and the Markup Languages (HTML, DHTML);

UNIT – III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT – IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

DHTML: Dynamic HTML, Features of DHTML,CSSP(cascading style sheet positioning) and JSSS(JavaScript assisted style sheet), Layers of netscape, The ID attributes, DHTML events.

SUGGESTED READINGS

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Satinder Bal Gupta & Brij Mohan Goel, "Web Design", Shree Mahavir Book Depot (Publishers) , New Delhi
3. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
4. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata McGraw-Hill
5. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.
6. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

BCA – 207: DATA STRUCTURE – II

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree, m-way search tree, Searching, Insertion and deletion in an m-way search tree, B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

UNIT – II

Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Topological sorting.

UNIT – III

Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Liner search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV

Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records, Primiry and secondary keys, Classification of files, File operations, Comparison of various types of files, File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization.
Hashing: Introduction, Hashing functions and Collision resolution methods .

SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orientlongman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.

BCA-208: Object Oriented Programming Using C++

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Object Oriented Programming Concepts : Procedural Language and Object Oriented approach, Characteristics of OOP, user defined types, polymorphism and encapsulation. Getting started with C++: syntax, data types, variables, string, function, namespace and exception, operators, flow control, recursion, array and pointer, structure .

UNIT-II

Abstracting Mechanism: classes, private and public, Constructor and Destructor , member function, static members, references;
Memory Management: new, delete, object copying, copy constructer, assignment operator, this input/output

UNIT-III

Inheritance and Polymorphism: Derived Class and Base Class, Different types of Inheritance,
Overriding member function, Abstract Class, Public and Private Inheritance, Ambiguity in Multiple inheritance , Virtual function, Friend function, Static function.

UNIT-IV

Exception Handling: Exception and derived class, function exception declaration, unexpected exception, exception when handling exception, resource capture and release.
Template and Standard Template Library: Template classes, declaration, template functions, namespace, string, iterators, hashes, iostreams and other types.

SUGGESTED READINGS

1. Herbert Schildts : C++ - The Complete Reference, Tata McGraw Hill Publications.
2. Balaguru Swamy : C++, Tata McGraw Hill Publications.
3. Balaguruswamy : Object Oriented Programming and C++, TMH.
4. Shah & Thakker : Programming in C++, ISTE/EXCEL.
5. Johnston : C++ Programming Today, PHI.
6. Object Oriented Programming and C++, Rajaram, New Age International.
7. Samanta : Object Oriented Programming with C++ & JAVA, PHI.

BCA-209 : Software Engineering

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models.

Software Requirements Analysis & Specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

UNIT – II

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project.

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT - III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.

UNIT - IV

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities.

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Suggested Readings

1. Satinder Bal Gupta," Software Engineering", Shree Mahavir Book Depot (Publishers) , New Delhi.
2. Gill, Nasib Singh : Software Engineering, Khanna Book Publishing Co. (P) Ltd. N. Delhi.
3. Pressman : Software Engineering, TMH.
4. Jalote, Pankaj : An Integrated Approach to Software Engineering, Narosa Publications.
5. Chhillar Rajender Singh : Software Engineering : Testing, Faults, Metrics, Excel Books, New Delhi.
6. Ghezzi, Carlo : Fundaments of Software Engineering, PHI.
7. Fairely, R.E. : Software Engineering Concepts, McGraw-Hill.

BCA-210 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-206 & BCA-208 USING HTML AND C++ LANGUAGE

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – 3rd YEAR(Vth and VIth SEMESTERS)

w.e.f. 2019-20

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

Vth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-301	Management information system	**80**	**20**	**3 Hours**
BCA-302	Computer Graphics	**80**	**20**	**3 Hours**
BCA-303	Data Communication and Networking	**80**	**20**	**3 Hours**
BCA-304	Visual Basic	**80**	**20**	**3 Hours**
BCA-305	Practical software Lab –Based on paper BCA- 304 i.e. Visual Basic	**80**	**20**	**3 Hours**

VIth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-306	E-Commerce	**80**	**20**	**3 Hours**
BCA-307	Object Technologies & Programming using Java	**80**	**20**	**3 Hours**
BCA-308	Artificial Intelligence	**80**	**20**	**3 Hours**
BCA-309	Introduction to .net	**80**	**20**	**3 Hours**
BCA-310	Practical software Lab– Based on paper-BCA-307 & 309 using java & .net	**80**	**20**	**3 Hours**

BCA – 301: MANAGEMENT INFORMATION SYSTEM

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

UNIT –II

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems.

UNIT – III

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

UNIT – IV

Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

SUGGESTED READINGS

1. J. Kanter, "Management/Information Systems", PHI.
2. Gordon B. Davis, M. H. Olson, "Management Information Systems – Conceptual foundations, structure and Development", McGraw Hill.
3. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill.
4. James A. Senn, "Analysis & Design of Information Systems", Second edition, McGraw Hill.
5. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
6. Lucas, "Analysis, Design & Implementation of Information System", McGraw Hill.

BCA-302: Computer Graphics

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Graphics Primitives: Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices.

Output Primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms .

UNIT-II

2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-III

3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon-rendering methods.

UNIT-IV

3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

SUGGESTED READINGS

1. Donald Hearn and M. Pauline Baker : Computer Graphics, PHI Publications.
2. Plastock : Theory & Problem of Computer Gaphics, Schaum Series.
3. Foley & Van Dam : Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K. : Computer Graphics, Springer-Verleg.

BCA – 303 : Data Communication and Networking

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model, TCP/IP reference model, Example Networks: The Internet, X.25, Frame Relay, ATM.

UNIT – II

Analog and Digital Communications Concepts: Concept of data, signal, channel, bid-rate , maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Asynchrous and synchrous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service.

UNIT - III

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth;
Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking;
Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms.

SUGGESTED READINGS

1. Satinder Bal Gupta & Ashis Goel," Data Communication and Networking", Shree Mahavir Book Depot (Publishers) , New Delhi.
2. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
3. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
4. James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
5. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.

BCA – 304 : Visual Basic

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to VB: Visual & non-visual programming, Procedural, Object-oriented and eventdriven programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Visual Development and Event Driven programming.

UNIT – II

Basics of Programming: Variables: Declaring variables, Types of variables, Converting variables types, User-defined data types, Forcing variable declaration, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement.

UNIT – III

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array. Collections: Adding, Removing, Counting, Returning items in a collection, Processing a collection.

UNIT – IV

Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types, Functions returning arrays.

Working with forms and menus : Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, creating menu, submenu, popup menus, Activate & deactivate events, Form-load event, menu designing in VB Simple programs in VB.

SUGGESTED READINGS

1. Steven Holzner, "Visual Basic 6 Programming: Black Book", Dreamtech Press.
2. Evangelos Petroutsos. "Mastering Visual Baisc 6", BPB Publications.
3. Julia Case Bradley & Anita C. Millspaugh, "Programming in Visual Basic 6.0", Tata McGraw-Hill Edition
4. Michael Halvorson, "Step by Step Microsoft Visual Basic 6.0 Professional", PHI
5. "Visual basic 6 Complete", BPB Publications.
6. Scott Warner, "Teach Yourself Visual basic 6", Tata McGraw-Hill Edition
7. Brian Siler and Jeff Spotts, "Using Visual Basic 6", Special Edition, PHI.

BCA-305 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-304 (VB LANGUAGE) AND BCA-302

BCA – 306: E-Commerce

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit 1

E-commerce and Types of E-commerce: Introduction, Definition, Evolution of E-Commerce, Major areas, Major Issues in Implementing, Comparison between Traditional Commerce and E-Commerce, Economic Potential, Driving Forces behind E-Commerce, Advantages and Disadvantages to Customers, Businesses and Society, Reasons for the E-Commerce Not Being Very Successful, Types of E-Commerce- B2B, B2C,C2B,C2C,B2G, Architectural Framework for E-Commerce, Impact on Business, Importance and Uses of E- Commerce, Applications of E-Commerce

Business Models: Introduction, Definitions, Key Components of Business Models, Types of Business Models, e-Shops-General Procedure, e-Procurement-Introduction, Definition, e-Auctions-Basic Operating Rules for e-Auction, Participants, Advantages of e-Auction Advantages to Sellers, Buyers, Auctioneers, Value Chain, Value Chain Integrators, Information Brokerage, Telecommunications, Telecommunication Methods in Business Communication, Collaboration Platforms

Unit II

Electronic Payment Systems: Introduction, Limitations of Traditional Payment, Comparison of Conventional and Electronic Payment System, Usage of E-Payment Systems, Critical Success Factors, Types of Electronic Payment Systems, Credit Card, Electronic Cheque System, Electronic Cash System, Smart Card, their comparison, Other Electronic Payments systems-P2P payment, Electronic wallets , E-Banking , Online Fund Transfer, ATM card, Security in Electronic Payments-Encryption, Electronic Certificates, Payment protocols

Advertisements: Introduction, Web Based Advertising, Types of Web-Based Advertising, Search Engine Advertisements, SEO, SEO Techniques, Advantages, Online share market operations, Online Marketing-Introduction, Definition, Importance, types

Unit-III

Email Marketing- Introduction, Use of Email, , social networking-marketing tool, Social Media, Social Media Marketing-objectives, risks, Viral Marketing-Introduction, The Viral Effect, working, E-Retailing: Introduction, Components, Meaning, Customer Relationship Management (CRM)-Introduction, Purpose, Levels, Features, Importance, Goals, relation with IT, e-CRM, difference from CRM, Tools for Online Research-Introduction, Secondary Market Research, Factors, Primary Research-Types, Surveys, Focus Groups, Interviews, Observation, Experiments/Field Trials, Primary vs. Secondary Research, Web survey-Design Guidelines, Online Focus Groups-When Appropriate, Limitations, Data Mining, Social Media-Types of Social Networking Sites, Data Mining from Social Networking Sites,

Unit IV

Cloud Computing: Introduction, Characteristics, Models, Deployment Strategies, Benefits, Challenges, use by Businesses, Applications, Enterprise Resource Planning (ERP): Introduction, Characteristics, Features, Need, Implementation, Risk and Governance Issues, Relation with E-Commerce, E-Commerce Security and Privacy: Introduction, Why an Issue, Security Issues, Types of Breaches, Security Measures, Online Fraud-Types, Privacy-Privacy Issues, Cyber Laws: Introduction, Need, IT Act of India 2000, Two Sides of Indian Cyber Law, classification of crimes under the IT Act, 2000

Suggested Readings:

1. Satinder Bal Gupta, " IT and E-Commerce", Mahavir Book Publications, Delhi
2. R.Kalakota and A.B.Whinston,Readings in Electronic Commerce, Addison Wesley,
3. Doing Business on the Internet E-COMMERCE S. Jaiswal;Galgotia Publications.
4. E-Commerce An Indian Perspective; P.T.Joseph; S.J.; PHI.
5. E-Commerce; S.Jaiswal – Galgotia.

BCA-307 : Object Technologies & Programming using Java

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Object Oriented Methodology-1: Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs .

Object Oriented Methodology-2: Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

UNIT-II

Java Language Basics*:* Introduction To Java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays.

Object Oriented Concepts: Class and Objects-- Class Fundamentals, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors , Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects , Method overloading, Garbage Collection, The Finalize ( ) Method.

Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

UNIT-III

Packages : Defining Package, CLASSPATH, Package naming, Accessibility of Packages , using Package Members.

Interfaces: Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together .

Exceptions Handling : Exception , Handling of Exception, Using try-catch , Catching Multiple Exceptions , Using finally clause , Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

UNIT-IV

Multithreading : Introduction , The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Inter thread Communication.

I/O in Java : I/O Basics, Streams and Stream Classes ,The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files , The Transient and Volatile Modifiers , Using Instance of Native Methods.

Strings and Characters : Fundamentals of Characters and Strings, The String Class , String Operations , Data Conversion using Value Of ( ) Methods , String Buffer Class and Methods.

Suggested Readings

1. Programming in Java, E Balagurusamy .
2. The Complete Reference JAVA, TMH Publication.
3. Begining JAVA, Ivor Horton, WROX Public.
4. JAVA 2 UNLEASHED, Tech Media Publications.
5. Patrick Naughton and Herbertz Schildt, “Java-2 The Complete reference”, 1999,TMH.

BCA-308 : Artificial Intelligence

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.

Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem

Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic : Represent ting Simple Facts in logic, Representing instances and is_a relationship, Computable function and predicate.

UNIT - III

Natural language processing : Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing.

Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells.

Suggested Readings

1. Satinder Bal Gupta, " Artificial Intelligence", Mahavir Book Publications, Delhi
2. David W. Rolston : Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company.
3. Elaine Rich, Kevin Knight : Artificial Intelligence, Tata McGraw Hill.
4. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999 .
5. Nils J Nilsson ,"Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

BCA – 309 : INTRODUCTION TO .NET

Time: 3 hours **External Marks: 80**
Internal Marks: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, Deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net, the evolution of Web development .

UNIT – II

Class Libraries in .Net, Introduction to Assemblies & Manifest in .Net, Metadata & attributes . Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing.

UNIT – III

Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity, Control constructs in C#: Decision making, loops, Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

UNIT – IV

Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces.

Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams).

SUGGESTED READINGS

1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill.
3. The Complete Guide to C# Programming by V. P. Jain.
4. C# : A Beginner's Guide, Herbert Schildt, Tata McGraw Hill.
5. C# and .NET Platform by Andrew Troelsen, Apress, 1st edition, 2001.

BCA-310 : PRACTICAL- SOFTWARE LAB – Based on paper BCA-307 and BCA-309

Indira Gandhi University, Meerpur
Rewari

Syllabus for BCA

Session –w.e.f. 2017-2018

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – Ist YEAR(Ist and 2nd SEMESTERS)

w.e.f. 2017-18

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

Paper No.	Title of Paper	Max. Marks		Exam Duration
		External	**Internal**	**3 Hours**
BCA-101	Computer & Programming Fundamentals	**80**	**20**	**3 Hours**
BCA-102	PC Software	**80**	**20**	**3 Hours**
BCA-103	Mathematics	**80**	**20**	**3 Hours**
BCA-104	Logical Organization of Computer-I	**80**	**20**	**3 Hours**
BCA-105	Practical software Lab – Based on paper BCA-102 i.e Word, Excel and Power point	**80**	**20**	**3 Hours**

Paper No.	Title of Paper	Max. Marks		Exam Duration
		External	**Internal**	**3 Hours**
BCA-106	'C' Programming	**80**	**20**	**3 Hours**
BCA-107	Logical Organization of Computer-II	**80**	**20**	**3 Hours**
BCA-108	Mathematical Foundations of Computer Science	**80**	**20**	**3 Hours**
BCA-109	Structured System Analysis and Design	**80**	**20**	**3 Hours**
BCA-110	Practical software Lab – Based on paper BCA-106, i.e.'C' Programming	**80**	**20**	**3 Hours**

BCA-101: COMPUTER & PROGRAMMING FUNDAMENTALS

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Computer Fundamentals: Generations of Computers, Definition, Block Diagram along with its components, characteristics & classification of computers, Limitations of Computers, Human-Being VS Computer, Applications of computers in various fields.

Memory: Concept of primary & secondary memory, RAM, ROM, types of ROM, Cache Memory, flash memory, Secondary storage devices: Sequential & direct access devices viz. magnetic tape, magnetic disk, optical disks i.e. CD, DVD, virtual memory.

UNIT-II

Computer hardware & software: I/O devices, definition of software, relationship between hardware and software, types of software.

Overview of operating system: Definition, functions of operating system, concept of multiprogramming, multitasking, multithreading, multiprocessing, time-sharing, real time, single-user & multi-user operating system.

Computer Virus: Definition, types of viruses, Characteristics of viruses, anti-virus software.

UNIT-III

Computer Languages: Analogy with natural language, machine language, assembly language, high-level languages, forth generation languages, compiler, interpreter, assembler, Linker, Loader , characteristics of a good programming language, Planning the Computer Program:

Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation.

Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming, Advantages and disadvantages of Structured programming.

UNIT-IV

Overview of Networking: An introduction to computer networking, Network types (LAN, WAN, MAN), Network topologies, Modes of data transmission, Forms of data transmission, Transmission channels(media), Introduction to internet and its uses, Applications of internet, Hardware and Software requirements for internet, Intranet, Applications of intranet.

SUGGESTED READINGS

1) Satinder Bal Gupta, Amit Singla: Computer Fundamentals & Programming in C, Shree Mahavir Book (Publishers), Delhi.
2) Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
3) Balagurusamy E, Computing Fundamentals and C Programming, Tata McGraw Hill.
4) Rajaraman, V., Fundamentals of Computers, PHI
5) Ram, B., Computer Fundamentals, Architecture & Organization, New Age International (P) Ltd.

BCA-102: PC SOFTWARE

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

MS-Windows: Operating system-Definition & functions, basics of Windows. Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance. Using windows accessories.

UNIT - II

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT - III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

UNIT - IV

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

SUGGESTED READINGS

1) Microsoft Office – Complete Reference – BPB Publication
2) Satinder Bal Gupta, Introductory Concepts of Information Technology, Shree Mahavir Book(Publishers), Delhi
3) Learn Microsoft Office – Russell A. Stultz – BPB Publication
4) Courter, G Marquis (1999). Microsoft Office 2000: Professional Edition. BPB.
5) Nelson, S L and Kelly, J (2002). Office XP: The Complete Reference. Tata McGraw-Hill.

BCA-103: MATHEMATICS

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT I

SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, Solving a system of linear equations.

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, solving system of linear equation Cramer's Rule.

UNIT II

RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity of a function at a Point, Continuity Over an Interval, Sum, product and quotient of continuous functions, Intermediate Value Theorem, Type of Discontinuities.

UNIT III

DIFFERENTIATION: Derivative of a function, Derivatives of Sum, Differences, Product & Quotient of functions, Derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions, Logarithmic Differentiation, Chain Rule and differentiation by substitution.

UNIT IV

INTEGRATION: Indefinite Integrals, Methods of Integration by Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for simple and Trigonometric Functions, Definite Integral as Limit of Sum, Fundamental Theorem of Integral Calculus, Evaluation of definite integrals by substitution, using properties of definite integral,

SUGGESTED READINGS

1) Satinder Bal Gupta: Discrete Mathematics and Structures, University Science Press, Delhi.
2) C.L.Liu: Elements of Discrete Mathematics, McGraw Hill.
3) Lipschutz, Seymour: Discrete Mathematics, Schaum's Series
4) Trembley, J.P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
5) Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.
6) Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
7) Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.

BCA-104 : LOGICAL ORGANIZATION OF COMPUTER-I

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Information Representation: Number Systems, Binary Arithmetic, Fixed-point and Floatingpoint representation of numbers, BCD Codes, Error detecting and correcting codes, Character Representation – ASCII, EBCDIC, Unicode

UNIT - II

Binary Logic: Boolean Algebra, Boolean Theorems, Boolean Functions and Truth Tables, Canonical and Standard forms of Boolean functions, Simplification of Boolean Functions – Venn Diagram, Karnaugh Maps.

UNIT - III

Digital Logic: Introduction to digital signals, Basic Gates – AND, OR, NOT, Universal Gates and their implementation – NAND, NOR, Other Gates – XOR, XNOR etc. NAND, NOR, AND-OR-INVERT and OR-AND-INVERT implementations of digital circuits, Combinational Logic – Characteristics, Design Procedures, analysis procedures, Multilevel NAND and NOR circuits.

UNIT - IV

Combinational Circuits: Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor, Parallel binary adder/subtractor, Encoders, Decoders, Multiplexers, Demultiplexers, Comparators, Code Converters, BCD to Seven-Segment Decoder.

SUGGESTED READINGS

1) Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.
2) M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt. Ltd.
3) V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4) Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5) Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA-105 : Practical- Software lab

(Based on paper BCA-102, PC Software)

BCA-106 : 'C' PROGRAMMING

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression:
Arithmetic, relational, logical, bitwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

UNIT-II

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement.
Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement, Nested loops.

UNIT-III

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions viz. getch(), getche(), getchar(), gets(), output functions viz., putch(), putchar(), puts(), string manipulation functions.
User defined functions: Introduction/Definition, prototype, Local and global variables, passing parameters, recursion.

UNIT-IV

Arrays, strings and pointers: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. String constant and variables, Declaration and initialization of string, Input/output of string data, Introduction to pointers.
Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.
Algorithm development, Flowcharting and Development of efficient program in C.

SUGGESTED READINGS

1) Satinder Bal Gupta, Amit Singla: Computer Fundamentals & Programming in C, Shree Mahavir Book (Publishers), Delhi.
2) Gottfried, Byron S., Programming with C, Tata McGraw Hill
3) Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi.
4) Yashwant Kanetker, Let us C, BPB.
5) Rajaraman, V., Computer Programming in C, PHI.
6) Yashwant Kanetker, Working with C, BPB.

BCA-107: LOGICAL ORGANIZATION OF COMPUTER-II

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Sequential Logic: Characteristics, Flip-Flops, Clocked RS, D type, JK, T type and Master-Slave flip-flops. State table, state diagram and state equations. Flip-flop excitation tables

UNIT - II

Sequential Circuits: Designing registers – Serial Input Serial Output (SISO), Serial Input Parallel Output (SIPO), Parallel Input Serial Output (PISO), Parallel Input Parallel Output (PIPO) and shift registers. Designing counters – Asynchronous and Synchronous Binary Counters, Modulo-N Counters and Up-Down Counters

UNIT - III

Memory & I/O Devices: Memory Parameters, Semiconductor RAM, ROM, Magnetic and Optical Storage devices, Flash memory, I/O Devices and their controllers.

UNIT - IV

Instruction Design & I/O Organization: Machine instruction, Instruction set selection, Instruction cycle, Instruction Format and Addressing Modes. I/O Interface, Interrupt structure, Program-controlled, Interrupt-controlled & DMA transfer, I/O Channels, IOP.

SUGGESTED READINGS

1) Gill, Nasib Singh and Dixit J.B.: Digital Design and Computer Organisation,University Science Press (Laxmi Publications), New Delhi.
2) M. Morris Mano, Digital Logic and Computer Design, Prentice Hall of India Pvt.Ltd.
3) V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall of India Pvt. Ltd.
4) Andrew S. Tanenbaum, Structured Computer Organization, Prentice Hall of India Pvt. Ltd.
5) Nicholas Carter, Schaum's Outlines Computer Architecture, Tata McGraw-Hill

BCA-108: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measure of Dispersion: Range, Variance and Standard Deviations, Correlation and Regression.

UNIT-II

Algorithm: Algorithms, merits and demerits, Exponentiation, How to compute fast exponentiation. Linear Search, Binary Search, "Big Oh" notation, Worst case, Advantage of logarithmic algorithms over linear algorithms, complexity.

Graph Theory: Graphs, Types of graphs, degree of vertex, sub graph, isomorphic and homeomorphic graphs, Adjacent and incidence matrices, Path Circuit ; Eulerian Hamiltonian path circuit.

UNIT-III

Tree: Trees, Minimum distance trees, Minimum weight and Minimum distance spanning trees.

Recursion: Recursively defined function.

Merge sort, Insertion sort, Bubble sort, and Decimal to Binary.

UNIT-IV

Recurrence Relations: LHRR, LHRRWCCs, DCRR. Recursive procedures.

Number Theory: Principle of Mathematical induction**,** GCD, Euclidean algorithm, Fibonacci numbers, congruences and equivalence relations, public key encryption schemes.

SUGGESTED READINGS

1) Satinder Bal Gupta: Discrete mathematics and Structures, University Science Press, Delhi.
2) Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
3) Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.
4) Graybill, Introduction to Statistics, McGraw.
5) Anderson, Statistical Modelling, McGraw.
6) Babu Ram : Discrete Mathematics

BCA-109 : Structured Systems Analysis and Design

External Marks: 80
Internal Marks: 20
Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to system, Definition and characteristics of a system, Elements of system, Types of system, System development life cycle, Role of system analyst, Analyst/user interface, System planning and initial investigation: Introduction, Bases for planning in system analysis, Sources of project requests, Initial investigation, Fact finding, Information gathering, information gathering tools, Fact analysis, Determination of feasibility.

UNIT-II

Structured analysis, Tools of structured analysis: DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured English, Pros and cons of each tool, Feasibility study: Introduction, Objective, Types, Steps in feasibility analysis, Feasibility report, Oral presentation, Cost and benefit analysis: Identification of costs and benefits, classification of costs and benefits, Methods of determining costs and benefits, Interpret results of analysis and take final action.

UNIT-III

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/Output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

UNIT-IV

System testing: Introduction, Objectives of testing, Test plan, testing techniques/Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.

SUGGESTED READINGS

1) Systems Analysis and design, E.M. AWAD Galgotia Pub.(P) Ltd.
2) Data Management and Data Structures, Loomis (PHI)
3) System Analysis and Design. Elias Awad.
4) Introductory System analysis and Design, Lee Vol. I & II

BCA-110: Practical- Software lab
(Based on paper BCA-106, C Programming)

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – 2nd YEAR(IIIrd and IVth SEMESTERS)

w.e.f. 2018-19

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

IIIrd Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-201	Introduction to Operating System	**80**	**20**	**3 Hours**
BCA-202	Data structures – i	**80**	**20**	**3 Hours**
BCA-203	Introduction to database system	**80**	**20**	**3 Hours**
BCA-204	Communication skills (English)	**80**	**20**	**3 Hours**
BCA-205	Practical software Lab – Based on paper BCA-202 & 203 using C Language and SQL	**80**	**20**	**3 Hours**

IVth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-206	Web Designing	**80**	**20**	**3 Hours**
BCA-207	Data Structures – II	**80**	**20**	**3 Hours**
BCA-208	Object Oriented Programming Using C++	**80**	**20**	**3 Hours**
BCA-209	Software Engineering	**80**	**20**	**3 Hours**
BCA-210	Practical software Lab– Based on paper BCA– 206 & 208, i.e.HTML and C++ Programming	**80**	**20**	**3 Hours**

BCA-201 : Introduction to Operating System

Time: 3 hours **External Marks: 80**
Internal Marks: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Fundamentals of Operating system: Introduction to Operating System, its need and operating System services, Early systems, Structures - Simple Batch, Multi programmed, timeshared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems.

Process Management: Process concept, Operation on processes, Cooperating Processes, Threads, and Inter-process Communication.

UNIT-II

CPU Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms : FCFS, SJF, Round Robin & Queue Algorithms.
Deadlocks: Deadlock characterization, Methods for handling deadlocks, Banker'sAlgorithm.

UNIT-III

Memory Management: Logical versus Physical address space, Swapping, Contiguous allocation, Paging, Segmentation.
Virtual Memory: Demand paging, Performance of demand paging, Page replacement, Page replacement algorithms, Thrashing.

UNIT-IV

File management: File system Structure, Allocation methods: Contiguous allocation, Linked allocation, Indexed allocation, Free space management: Bit vector, Linked list, Grouping, Counting.
Device Management: Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK.

Suggested Readings

1. Abraham Silberschatz, Peter B. Galvin, " Operating System Concepts", Addison-Wesley publishing. Co., 7th. Ed., 2004.
2. Nutt Gary, "Operating Systems", Addison Wesley Publication, 2000.
3. Andrew S. Tannenbaum, "Modern Operating Systems", Pearson Education Asia, Second Edition, 2001.
4. William Stallings, "Operating Systems, "Internals and Design Principles", 4th Edition, PH, 2001.
5. Ekta Walia, "Operating Systems Concepts", Khanna Publishes, New Delhi, 2002.

BCA – 202 : DATA STRUCTURES – I

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notataion.

Strings: Introduction, Storing strings, String operations, Pattern matching algorithms.

UNIT – II

Arrays: Introduction, Linear arrays, Representation of linear array in memory, address calculations, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, Sparse arrays.

Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

UNIT – III

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion.

Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues.

UNIT – IV

Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks.

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orient Longman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss Data Structures and Algorithm Analysis In C, Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.
5. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C", Prentice- Hall of India Pvt. Ltd., New Delhi.

BCA – 203 : INTRODUCTION TO DATABASE SYSTEM

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Basic Concepts – Data, Information, Records and files. Traditional file –based Systems-File Based Approach-Limitations of File Based Approach, Database Approach-Characteristics of Database Approach, advantages and disadvantages of database system, components of database system, Database Management System (DBMS), Components of DBMS Environment, DBMS Functions and Components, DBMS users, Advantages and Disadvantages of DBMS, DBMS languages.

Roles in the Database Environment - Data and Database Administrator, Database Designers, Applications Developers and Users .

UNIT – II

Database System Architecture – Three Levels of Architecture, External, Conceptual and Internal Levels, Schemas, Mappings and Instances .

Data Independence – Logical and Physical Data Independence .

Classification of Database Management System, Centralized and Client Server architecture to DBMS .

Data Models: Records- based Data Models, Object-based Data Models, Physical Data Models and Conceptual Modeling.

UNIT – III

Entity-Relationship Model – Entity Types, Entity Sets, Attributes Relationship Types, Relationship Instances and ER Diagrams, abstraction and integration.

Basic Concepts of Hierarchical and Network Data Model, Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, .

UNIT – IV

Relational algebra, Relational calculus, Relational database design: Functional dependencies, Modification anomalies, Ist to 3^{rd} NFs, BCNF, 4^{th} and 5^{th} NFs, computing closures of set FDs, SQL: Data types, Basic Queries in SQL, Insert, Delete and Update Statements, Views, Query processing: General strategies of query processing, query optimization, query processor, concept of security, concurrency and recovery.

SUGGESTED READINGS

1. Satinder Bal Gupta & Aditya Mittal, "Introduction to Data Base Management System", University Science Press, New Delhi.
2. Elmasri & Navathe, "Fundamentals of Database Systems", 5th edition, Pearson Education.
3. Thomas Connolly Carolyn Begg, "Database Systems", 3/e, Pearson Education
4. C. J. Date, "An Introduction to Database Systems", 8^{th} edition, Addison Wesley N. Delhi.

BCA-204 : COMMUNICATION SKILLS (ENGLISH)

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Basics of Communication: Communication and its various definition, features/characteristics of the communication, process of communication, communication model and theories, barrier to effective communication.

UNIT-II

Improving LSRW: introduction, verbal and nonverbal communication, listening process, group discussion, forms of oral presentation, self-presentation, dyadic communication, 5C's of communication, Developing dialogues, soft skill.

UNIT-III

Basic vocabulary: how to improve vocabulary, prefix/suffix, synonyms/antonyms, one word substitution, spellings

Developing fluency: grammar (conjunction, auxiliaries, prepositions, articles, tenses……), language games.

UNIT-IV

Proper use of Language: The Communication Skills, The effective Speech.

Effective self-presentation & facing interview: The interview process & preparing for it, The presentation skills.

SUGGESTED READINGS

1. Vik, Gilsdorf, "Business Communication", Irwin
2. K K Sinha, "Business Communication", Himalaya Publishing House / Galgoria Publication
3. Bovee, "Business Communication", Pearson ' PHI
4. Mohan, Banerjee, Business Communication, Mac million
5. Raman, Singh – Business communication – Oxford Press

BCA-205 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-202 & 203 USING C LANGUAGE AND SQL.

BCA – 206 : WEB DESIGNING

External Marks:80
Internal Marks:20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT – II

Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML.

Creating a Website and the Markup Languages (HTML, DHTML);

UNIT – III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT – IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

DHTML: Dynamic HTML, Features of DHTML,CSSP(cascading style sheet positioning) and JSSS(JavaScript assisted style sheet), Layers of netscape, The ID attributes, DHTML events.

SUGGESTED READINGS

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Satinder Bal Gupta & Brij Mohan Goel, "Web Design", Shree Mahavir Book Depot (Publishers) , New Delhi
3. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
4. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata McGraw-Hill
5. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.
6. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

BCA – 207: DATA STRUCTURE – II

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree, m-way search tree, Searching, Insertion and deletion in an m-way search tree, B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

UNIT – II

Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Topological sorting.

UNIT – III

Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Liner search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV

Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records, Primiry and secondary keys, Classification of files, File operations, Comparison of various types of files, File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization.
Hashing: Introduction, Hashing functions and Collision resolution methods .

SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni & Anderson-Freed, "Fundamentals of Data Structures in C", Orientlongman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt. Ltd., New Delhi.

BCA-208: Object Oriented Programming Using C++

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Object Oriented Programming Concepts : Procedural Language and Object Oriented approach, Characteristics of OOP, user defined types, polymorphism and encapsulation. Getting started with C++: syntax, data types, variables, string, function, namespace and exception, operators, flow control, recursion, array and pointer, structure .

UNIT-II

Abstracting Mechanism: classes, private and public, Constructor and Destructor , member function, static members, references;
Memory Management: new, delete, object copying, copy constructer, assignment operator, this input/output

UNIT-III

Inheritance and Polymorphism: Derived Class and Base Class, Different types of Inheritance,
Overriding member function, Abstract Class, Public and Private Inheritance, Ambiguity in Multiple inheritance , Virtual function, Friend function, Static function.

UNIT-IV

Exception Handling: Exception and derived class, function exception declaration, unexpected exception, exception when handling exception, resource capture and release.
Template and Standard Template Library: Template classes, declaration, template functions, namespace, string, iterators, hashes, iostreams and other types.

SUGGESTED READINGS

1. Herbert Schildts : C++ - The Complete Reference, Tata McGraw Hill Publications.
2. Balaguru Swamy : C++, Tata McGraw Hill Publications.
3. Balaguruswamy : Object Oriented Programming and C++, TMH.
4. Shah & Thakker : Programming in C++, ISTE/EXCEL.
5. Johnston : C++ Programming Today, PHI.
6. Object Oriented Programming and C++, Rajaram, New Age International.
7. Samanta : Object Oriented Programming with C++ & JAVA, PHI.

BCA-209 : Software Engineering

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction: Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models.

Software Requirements Analysis & Specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

UNIT – II

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project.

Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT - III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.

UNIT - IV

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities.

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Suggested Readings

1. Satinder Bal Gupta," Software Engineering", Shree Mahavir Book Depot (Publishers) , New Delhi.
2. Gill, Nasib Singh : Software Engineering, Khanna Book Publishing Co. (P) Ltd. N. Delhi.
3. Pressman : Software Engineering, TMH.
4. Jalote, Pankaj : An Integrated Approach to Software Engineering, Narosa Publications.
5. Chhillar Rajender Singh : Software Engineering : Testing, Faults, Metrics, Excel Books, New Delhi.
6. Ghezzi, Carlo : Fundaments of Software Engineering, PHI.
7. Fairely, R.E. : Software Engineering Concepts, McGraw-Hill.

BCA-210 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-206 & BCA-208 USING HTML AND C++ LANGUAGE

BACHELOR OF COMPUTER APPLICATIONS (BCA) Regular

SYLLABUS AND SCHEME OF EXAMINATION – 3rd YEAR(Vth and VIth SEMESTERS)

w.e.f. 2019-20

Period per week: 6 for each theory paper and 6 for each practical group in each semester.

Vth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-301	Management information system	**80**	**20**	**3 Hours**
BCA-302	Computer Graphics	**80**	**20**	**3 Hours**
BCA-303	Data Communication and Networking	**80**	**20**	**3 Hours**
BCA-304	Visual Basic	**80**	**20**	**3 Hours**
BCA-305	Practical software Lab –Based on paper BCA- 304 i.e. Visual Basic	**80**	**20**	**3 Hours**

VIth Semester				
Paper No.	**Title of Paper**	**Max. Marks**		**Exam Duration**
		External	**Internal**	**3 Hours**
BCA-306	E-Commerce	**80**	**20**	**3 Hours**
BCA-307	Object Technologies & Programming using Java	**80**	**20**	**3 Hours**
BCA-308	Artificial Intelligence	**80**	**20**	**3 Hours**
BCA-309	Introduction to .net	**80**	**20**	**3 Hours**
BCA-310	Practical software Lab– Based on paper-BCA-307 & 309 using java & .net	**80**	**20**	**3 Hours**

BCA – 301: MANAGEMENT INFORMATION SYSTEM

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to system and Basic System Concepts, Types of Systems, The Systems Approach, Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system: EDP and MIS management levels, EDP/MIS/DSS.

UNIT –II

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems.

UNIT – III

Developing Information Systems: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development.

UNIT – IV

Functional MIS: A Study of Personnel, Financial and production MIS, Introduction to e-business systems, ecommerce – technologies, applications, Decision support systems – support systems for planning, control and decision-making

SUGGESTED READINGS

1. J. Kanter, "Management/Information Systems", PHI.
2. Gordon B. Davis, M. H. Olson, "Management Information Systems – Conceptual foundations, structure and Development", McGraw Hill.
3. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill.
4. James A. Senn, "Analysis & Design of Information Systems", Second edition, McGraw Hill.
5. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
6. Lucas, "Analysis, Design & Implementation of Information System", McGraw Hill.

BCA-302: Computer Graphics

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Graphics Primitives: Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices.

Output Primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood-fill algorithms .

UNIT-II

2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-III

3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon-rendering methods.

UNIT-IV

3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

SUGGESTED READINGS

1. Donald Hearn and M. Pauline Baker : Computer Graphics, PHI Publications.
2. Plastock : Theory & Problem of Computer Gaphics, Schaum Series.
3. Foley & Van Dam : Fundamentals of Interactive Computer Graphics, Addison-Wesley.
4. Newman : Principles of Interactive Computer Graphics, McGraw Hill.
5. Tosijasu, L.K. : Computer Graphics, Springer-Verleg.

BCA – 303 : Data Communication and Networking

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices, Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Network Applications and Application Protocols; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model, Peer-to-Peer Model, Web-Based Model, Network Architecture and the OSI Reference Model, TCP/IP reference model, Example Networks: The Internet, X.25, Frame Relay, ATM.

UNIT – II

Analog and Digital Communications Concepts: Concept of data, signal, channel, bid-rate , maximum data-rate of channel, Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Asynchrous and synchrous transmission, data encoding techniques, Modulation techniques, Digital Carrier Systems; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Dialup Networking; Analog Modem Concepts; DSL Service.

UNIT - III

Data Link Layer: Framing, Flow Control, Error Control; Error Detection and Correction; Sliding Window Protocols; Media Access Control: Random Access Protocols, Token Passing Protocols; Token Ring; Introduction to LAN technologies: Ethernet, switched Ethernet, VLAN, fast Ethernet, gigabit Ethernet, token ring, FDDI, Wireless LANs; Bluetooth;
Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways.

UNIT – IV

Network Layer and Routing Concepts: Virtual Circuits and Datagrams; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control Algorithms; Internetworking;
Network Security Issues: Security threats; Encryption Methods; Authentication; Symmetric – Key Algorithms; Public-Key Algorithms.

SUGGESTED READINGS

1. Satinder Bal Gupta & Ashis Goel," Data Communication and Networking", Shree Mahavir Book Depot (Publishers) , New Delhi.
2. Michael A. Gallo, William M. Hancock, "Computer Communications and Networking Technologies", CENGAGE Learning.
3. Andrew S. Tanenbaum, "Computer Networks", Pearson Education.
4. James F. Kurose, Keith W. Ross, "Computer Networking", Pearson Education.
5. Behrouz A Forouzan, "Data Communications and Networking", McGraw Hill.

BCA – 304 : Visual Basic

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introduction to VB: Visual & non-visual programming, Procedural, Object-oriented and eventdriven programming languages, The VB environment: Menu bar, Toolbar, Project explorer, Toolbox, Properties window, Form designer, Form layout, Immediate window. Visual Development and Event Driven programming.

UNIT – II

Basics of Programming: Variables: Declaring variables, Types of variables, Converting variables types, User-defined data types, Forcing variable declaration, Scope & lifetime of variables. Constants: Named & intrinsic. Operators: Arithmetic, Relational & Logical operators. I/O in VB: Various controls for I/O in VB, Message box, Input Box, Print statement.

UNIT – III

Programming with VB: Decisions and conditions: If statement, If-then-else, Select-case. Looping statements: Do-loops, For-next, While-wend, Exit statement. Nested control structures. Arrays: Declaring and using arrays, one-dimensional and multi-dimensional arrays, Static & dynamic arrays, Arrays of array. Collections: Adding, Removing, Counting, Returning items in a collection, Processing a collection.

UNIT – IV

Programming with VB: Procedures: General & event procedures, Subroutines, Functions, Calling procedures, Arguments- passing mechanisms, Optional arguments, Named arguments, Functions returning custom data types, Functions returning arrays.

Working with forms and menus : Adding multiple forms in VB, Hiding & showing forms, Load & unload statements, creating menu, submenu, popup menus, Activate & deactivate events, Form-load event, menu designing in VB Simple programs in VB.

SUGGESTED READINGS

1. Steven Holzner, "Visual Basic 6 Programming: Black Book", Dreamtech Press.
2. Evangelos Petroutsos. "Mastering Visual Baisc 6", BPB Publications.
3. Julia Case Bradley & Anita C. Millspaugh, "Programming in Visual Basic 6.0", Tata McGraw-Hill Edition
4. Michael Halvorson, "Step by Step Microsoft Visual Basic 6.0 Professional", PHI
5. "Visual basic 6 Complete", BPB Publications.
6. Scott Warner, "Teach Yourself Visual basic 6", Tata McGraw-Hill Edition
7. Brian Siler and Jeff Spotts, "Using Visual Basic 6", Special Edition, PHI.

BCA-305 : PRACTICAL- SOFTWARE LAB
PRACTICAL BASED ON PAPER BCA-304 (VB LANGUAGE) AND BCA-302

BCA – 306: E-Commerce

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit 1

E-commerce and Types of E-commerce: Introduction, Definition, Evolution of E-Commerce, Major areas, Major Issues in Implementing, Comparison between Traditional Commerce and E-Commerce, Economic Potential, Driving Forces behind E-Commerce, Advantages and Disadvantages to Customers, Businesses and Society, Reasons for the E-Commerce Not Being Very Successful, Types of E-Commerce- B2B, B2C,C2B,C2C,B2G, Architectural Framework for E-Commerce, Impact on Business, Importance and Uses of E- Commerce, Applications of E-Commerce

Business Models: Introduction, Definitions, Key Components of Business Models, Types of Business Models, e-Shops-General Procedure, e-Procurement-Introduction, Definition, e-Auctions-Basic Operating Rules for e-Auction, Participants, Advantages of e-Auction Advantages to Sellers, Buyers, Auctioneers, Value Chain, Value Chain Integrators, Information Brokerage, Telecommunications, Telecommunication Methods in Business Communication, Collaboration Platforms

Unit II

Electronic Payment Systems: Introduction, Limitations of Traditional Payment, Comparison of Conventional and Electronic Payment System, Usage of E-Payment Systems, Critical Success Factors, Types of Electronic Payment Systems, Credit Card, Electronic Cheque System, Electronic Cash System, Smart Card, their comparison, Other Electronic Payments systems-P2P payment, Electronic wallets , E-Banking , Online Fund Transfer, ATM card, Security in Electronic Payments-Encryption, Electronic Certificates, Payment protocols

Advertisements: Introduction, Web Based Advertising, Types of Web-Based Advertising, Search Engine Advertisements, SEO, SEO Techniques, Advantages, Online share market operations, Online Marketing-Introduction, Definition, Importance, types

Unit-III

Email Marketing- Introduction, Use of Email, , social networking-marketing tool, Social Media, Social Media Marketing-objectives, risks, Viral Marketing-Introduction, The Viral Effect, working, E-Retailing: Introduction, Components, Meaning, Customer Relationship Management (CRM)-Introduction, Purpose, Levels, Features, Importance, Goals, relation with IT, e-CRM, difference from CRM, Tools for Online Research-Introduction, Secondary Market Research, Factors, Primary Research-Types, Surveys, Focus Groups, Interviews, Observation, Experiments/Field Trials, Primary vs. Secondary Research, Web survey-Design Guidelines, Online Focus Groups-When Appropriate, Limitations, Data Mining, Social Media-Types of Social Networking Sites, Data Mining from Social Networking Sites,

Unit IV

Cloud Computing: Introduction, Characteristics, Models, Deployment Strategies, Benefits, Challenges, use by Businesses, Applications, Enterprise Resource Planning (ERP): Introduction, Characteristics, Features, Need, Implementation, Risk and Governance Issues, Relation with E-Commerce, E-Commerce Security and Privacy: Introduction, Why an Issue, Security Issues, Types of Breaches, Security Measures, Online Fraud-Types, Privacy-Privacy Issues, Cyber Laws: Introduction, Need, IT Act of India 2000, Two Sides of Indian Cyber Law, classification of crimes under the IT Act, 2000

Suggested Readings:

1. Satinder Bal Gupta, " IT and E-Commerce", Mahavir Book Publications, Delhi
2. R.Kalakota and A.B.Whinston,Readings in Electronic Commerce, Addison Wesley,
3. Doing Business on the Internet E-COMMERCE S. Jaiswal;Galgotia Publications.
4. E-Commerce An Indian Perspective; P.T.Joseph; S.J.; PHI.
5. E-Commerce; S.Jaiswal – Galgotia.

BCA-307 : Object Technologies & Programming using Java

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Object Oriented Methodology-1: Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs .

Object Oriented Methodology-2: Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

UNIT-II

Java Language Basics*:* Introduction To Java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type And Variables, Java Operators, Expressions, Statements and Arrays.

Object Oriented Concepts: Class and Objects-- Class Fundamentals, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors , Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects , Method overloading, Garbage Collection, The Finalize ( ) Method.

Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

UNIT-III

Packages : Defining Package, CLASSPATH, Package naming, Accessibility of Packages , using Package Members.

Interfaces: Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together .

Exceptions Handling : Exception , Handling of Exception, Using try-catch , Catching Multiple Exceptions , Using finally clause , Types of Exceptions, Throwing Exceptions, Writing Exception Subclasses.

UNIT-IV

Multithreading : Introduction , The Main Thread, Java Thread Model, Thread Priorities, Synchronization in Java, Inter thread Communication.

I/O in Java : I/O Basics, Streams and Stream Classes ,The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files , The Transient and Volatile Modifiers , Using Instance of Native Methods.

Strings and Characters : Fundamentals of Characters and Strings, The String Class , String Operations , Data Conversion using Value Of ( ) Methods , String Buffer Class and Methods.

Suggested Readings

1. Programming in Java, E Balagurusamy .
2. The Complete Reference JAVA, TMH Publication.
3. Begining JAVA, Ivor Horton, WROX Public.
4. JAVA 2 UNLEASHED, Tech Media Publications.
5. Patrick Naughton and Herbertz Schildt, “Java-2 The Complete reference”, 1999,TMH.

BCA-308 : Artificial Intelligence

External Marks: 80
Internal Marks: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success.

Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem

Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic : Represent ting Simple Facts in logic, Representing instances and is_a relationship, Computable function and predicate.

UNIT - III

Natural language processing : Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing.

Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells.

Suggested Readings

1. Satinder Bal Gupta, " Artificial Intelligence", Mahavir Book Publications, Delhi
2. David W. Rolston : Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company.
3. Elaine Rich, Kevin Knight : Artificial Intelligence, Tata McGraw Hill.
4. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999 .
5. Nils J Nilsson ,"Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

BCA – 309 : INTRODUCTION TO .NET

Time: 3 hours **External Marks: 80**
Internal Marks: 20

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 8 parts (short-answer type questions) covering the entire syllabus and will carry 16 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 16 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT – I

The Framework of .Net: Building blocks of .Net Platform (the CLR, CTS and CLS), Features of .Net, Deploying the .Net Runtime, Architecture of .Net platform, Introduction to namespaces & type distinction. Types & Object in .Net, the evolution of Web development .

UNIT – II

Class Libraries in .Net, Introduction to Assemblies & Manifest in .Net, Metadata & attributes . Introduction to C#: Characteristics of C#, Data types: Value types, reference types, default value, constants, variables, scope of variables, boxing and unboxing.

UNIT – III

Operators and expressions: Arithmetic, relational, logical, bitwise, special operators, evolution of expressions, operator precedence & associativity, Control constructs in C#: Decision making, loops, Classes & methods: Class, methods, constructors, destructors, overloading of operators & functions.

UNIT – IV

Inheritance & polymorphism: visibility control, overriding, abstract class & methods, sealed classes & methods, interfaces.

Advanced features of C#: Exception handling & error handling, automatic memory management, Input and output (Directories, Files, and streams).

SUGGESTED READINGS

1. Introduction to C# using .NET By Robert J. Oberg, PHI, 2002.
2. Programming in C# By E. Balaguruswamy, Tata McGraw Hill.
3. The Complete Guide to C# Programming by V. P. Jain.
4. C# : A Beginner's Guide, Herbert Schildt, Tata McGraw Hill.
5. C# and .NET Platform by Andrew Troelsen, Apress, 1st edition, 2001.

BCA-310 : PRACTICAL- SOFTWARE LAB – Based on paper BCA-307 and BCA-309

SCHEME OF EXAMINATION AND SYLLABUS OF
B.COM. HONS.PROGRAMME
w. e. f. ACADEMIC SESSION 2019-20

DEPARTMENT OF COMMERCE
INDIRA GANDHI UNIVERSITY MEERPUR, REWARI (HARYANA)-123401

B.COM-HONS. PROGRAMME
w. e. f. SESSION 2019-20

Programme structure

a) Duration of the programme: Total duration of the course is 3 years full time .

b) Number of Semesters: The .Com (Hons.) Degree Programme is divided into 3 academic years. Each Academic year will consist two semesters- one odd semester and one even semester.

SCHEME OF EXAMINATION

FIRST SEMESTER(w.e.f. Academic Session 2019-20)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-101	Fundamentals of Accounting	CC	4	1	0	5	80	20	100
2	BCH-102	Basics of Statistics	CC	4	1	0	5	80	20	100
3	BCH-103	Business Communication	CC	4	1	0	5	80	20	100
4	BCH-104	Fundamentals of Economics	CC	4	1	0	5	80	20	100
5	BCH-105	Indian Banking System	CC	4	1	0	5	80	20	100
6	BCH-106	Basics of Computer	CC	3	0	4	5	60(T) 40(P)	00	100
7	BCH-107	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
		Total		**23**	**5**	**8**	**32**			**650**

SECOND SEMESTER (w.e.f. Academic Session 2019-20)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-201	Financial Accounting	CC	4	1	0	5	80	20	100
2	BCH-202	Business Statistics	CC	4	1	0	5	80	20	100
3	BCH-203	Principles of Management	CC	4	1	0	5	80	20	100
4	BCH-204	Business Economics	CC	4	1	0	5	80	20	100
5	BCH-205	Fundamentals of Insurance	CC	4	1	0	5	80	20	100
6	BCH-206	Computer Applications in Business	CC	3	0	4	5	60(T) 40(P)	00	100
7	BCH-207	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
8	BCH-208	Environmental Studies	FC	2	0	0	2	80	20	100
		Total		**25**	**5**	**8**	**34**			**750**

THIRD SEMESTER(w.e.f. Academic Session 2020-21)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-301	Corporate Accounting-I	CC	4	1	0	5	80	20	100
2	BCH-302	Cost Accounting-1	CC	4	1	0	5	80	20	100
3	BCH-303	Company Law-I	CC	4	1	0	5	80	20	100
4	BCH-304	Indian Economy	CC	4	1	0	5	80	20	100
5	BCH-305	Principles of Marketing	CC	4	1	0	5	80	20	100
6	BCH-306	Business Mathematics	CC	4	1	0	5	80	20	100
7	BCH-307	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
		Total		**24**	**6**	**4**	**32**			**650**

FOURTH SEMESTER(w.e.f. Academic Session 2020-21)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-401	Corporate Accounting-II	CC	4	1	0	5	80	20	100
2	BCH-402	Cost Accounting-II	CC	4	1	0	5	80	20	100
3	BCH-403	Company Law-II	CC	4	1	0	5	80	20	100
4	BCH-404	Goods and Services Tax	CC	4	1	0	5	80	20	100
5	BCH-405	Human Resource Management	CC	4	1	0	5	80	20	100
6	BCH-406	Auditing	CC	4	1	0	5	80	20	100
7	BCH-407	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
		Total		**24**	**6**	**4**	**32**			**650**

FIFTH SEMESTER(w.e.f. Academic Session 2021-22)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-501	Income Tax	CC	4	1	0	5	80	20	100
2	BCH-502	Financial Management	CC	4	1	0	5	80	20	100
3	BCH-503	Business Laws	CC	4	1	0	5	80	20	100
4	BCH-504	Business Environment	CC	4	1	0	5	80	20	100
5	BCH-505	Financial Market Operations	CC	4	1	0	5	80	20	100
6	BCH-506	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
7		Subject Elective Course[@@]	DCEC	4	1	0	5	80	20	100
		Total		**24**	**6**	**4**	**32**			**650**

@@In fifth semester the students will select any one of the following course offered under DCEC:

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-507	E-Commerce	DCEC	4	1	0	5	80	20	100
2	BCH-508	Retail Management	DCEC	4	1	0	5	80	20	100
3	BCH-509	Business Ethics	DCEC	4	1	0	5	80	20	100

SIXTH SEMESTER (w.e.f. Academic Session 2021-22)

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-601	Income Tax Law & Administration	CC	4	1	0	5	80	20	100
2	BCH-602	Accounting for Managers	CC	4	1	0	5	80	20	100
3	BCH-603	Business Regulatory Framework	CC	4	1	0	5	80	20	100
4	BCH-604	International Business	CC	4	1	0	5	80	20	100
5	BCH-605	Investment Analysis	CC	4	1	0	5	80	20	100
6	BCH-606	Comprehensive Viva-Voce	CC	0	0	4	2	50(P)	00	50
7		Subject Elective Course[@@]	CC	4	1	0	5	-	-	100
		Total		**24**	**6**	**4**	**32**			**650**

@@In Sixth semester the students will select any one of the following course offered under DCEC:

Sr. No.	Course Code	Nomenclature of the Course	Type of Course	Contact Hours Per Week			Credits	External marks	Internal Marks	Total Marks
				L	T	P				
1	BCH-607	Contemporary Issues in Commerce[&]	DCEC	4	1	0	5	60(T) 20(P)[&]	20	100
2	BCH-608	International Marketing	DCEC	4	1	0	5	80	20	100
3	BCH-609	Income Tax Planning	DCEC	4	1	0	5	80	20	100

& In this paper the students will be assigned a practical assignment of 20 marks on 'Contemporary Issues in Commerce' which may be a case study or any other practical application of theoretical knowledge. It will be evaluated by a panel of examiners which consists of one external examiner (From the panel of examiners given by University) and one internal Examiner.

IMPORTANT INFORMATION AND GUIDELINES

1. In above tables, L stands for Lectures, T stands for tutorials, P for Practical and C means total credits for the papers.

2. The courses are categorized in the following categories:
   - Core course(CC) means compulsory course (papers),
   - Discipline Centric Elective Course(DCEC) means Optional course (Papers) within the department
   - Foundation Course (FC)- A compulsary paper to enhance the understanding related to Environmental studies in second semester.

3. **Credits are defined as below:**

   One credit of subject is equivalent to one hour of theory lecture per week/one hour of tutorial per week or two hours of practical per week.

   In case of Core Courses (CC) and Department Centric Elective Course (DCEC) the Total credits of 5 will be divided into 4 hours of theory and one hour of **tutorial** per week. Or it may be 4 hours of theory and 2 hours of **practical** per week.

4. Size of Group of students
   For Tutorials: 20 Students
   For Practicals: 15 Students

5. The internal assessment marks shall be based on factors such as:
   Ten marks for one internal test, five marks for written assignments and presentations and five marks for Class attendance (as per university ordinance).

6. The semester 1^{st} to 6^{th} will consist a paper namely comprehensive Viva-Voce covering the whole syllabi of that semester. It will be of 50 marks and consist 2 credits. The comprehensive viva will be conducted by a panel of examiners which consists of one external examiner (From the panel of examiners given by University) and one internal Examiner.

7. English shall be the medium of instruction.

8. The duration of written examination for each course shall be three hours.

CONSOLIDATED SCHEMES

Semester	Total Marks	Total Credits	Total Contact Hours Per Week		
			L	T	P
B.Com(H) 1st	650	32	23	5	8
B.Com(H) 2nd	750	34	25	5	8
B.Com(H) 3rd	650	32	24	6	4
B.Com(H) 4th	650	32	24	6	4
B.Com(H) 5th	650	32	24	6	4
B.Com(H)6th	650	32	24	6	4
Total	**4000**	**194**	**144**	**34**	**32**

Core courses (C.C.)

B.Com(Hons,)-Ist Semester w.e.f. session 2019-20
Fundamentals of Accounting
Course Code: BCH-101

Time: 3 Hrs
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The Examiner will set at least three numerical questions in question paper.

Unit-1

Introduction: meaning, objectives, process, limitations and basic terms of Accounting; Generally accepted Accounting Principles; Journalizing, Posting and Preparation of trial balance.

Financial accounting standards: concept, benefits, procedure for issuing accounting standards in India. Types ofAccounting Standards.

Capital and revenue items; Reserves and Provisions;

Unit-2

The nature of depreciation. The accounting concept of depreciation. Factors in the measurement of depreciation. Methods of computing depreciation: straight line method and diminishing balance method; Disposal of depreciable assets - change of method.

Unit-3

Final Accounts of non corporate business entities with adjustments; Rectification of errors

Unit-4

Accounting for non-profit organizations, Voyage Accounts.

Suggested Readings:

1. T.P.Ghosh – Accounting Standards and Corporate Accounting Practices – Taxman Allied Services.
2. L.S.Porwal – Accounting Theory – Tata Mcgraw Hill.
3. Gupta R.L. and Radha Swami M., Financial Accounting, Sultan Chand and Sons., New Delhi.
4. Monga J.R., Ahuja Girish and Sehgal Ashok: Financial Accounting, Mayur Paper Back, Noida.
5. Shukla M.C., Grewal T.S. and Gupta S.C.; Advanced Accounts, S. Chand and Company, New Delhi.
6. Gupta & Chaturvedi, Financial Accounting, Mahavir Publications, Delhi
7. Goel, D.K., Financial Accounting, Arya Publications, New Delhi

B.Com(Hons.)-Ist Semester w.e.f. session 2019-20
Basics of Statistics
Course Code: BCH-102

Time: 3 Hrs
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The Examiner will set at least three numerical questions in question paper.

Unit-1

Statistics: Meaning, Definition, Needs & Objectives Collection of data – types, methods, classification and tabulation of data, graphic and diagrammatic presentation.

Unit-2

Measurement of Central Tendency and Variation – Mathematical and fractional averages. Measures of absolute and relative variations.

Unit-3

Moments, skewness and kurtosis (with Sheppard's corrections),

Unit-4

Index Numbers-Methods of constructing, Test of adequacy, base shifting and splicing, consumer price index.

Statistical Decision Theory: Ingredients, expected opportunity loss, optimal decisions with maximin, minimax and Bayes' principle (with prior, pre-posterior and posterior analysis).

Suggested Readings

1. Dr.S.P.Gupta, Statistical methods, S.Chand & Co., New Delhi.
2. D.N.Elhance, Veena Elhance, B.M.Aggarwal, Fundamentals of Statistics, Kitab Mahal.
3. N.P.Aggarwal, Quantitative Techniques, Ramesh Book Depot., Jaipur.
4. R.P.Hooda, Statistics for Business and Economics, Mcmillan India Ltd., New Delhi.

B.Com(Hons.)-Ist Semester w.e.f. session 2019-20
Business Communication
Course Code: BCH-103

Time: 3 Hrs
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Basics and essentials of Communication: Meaning, Objectives of Communication, Role of Communication, Process and Elements of Communication, Communication Networks, Types and Media of Communication**,** Corporate Communication - Communication Training for Managers, Barriers to Communication

Unit-2

Basic Patterns of Business Messages: Writing process,. Business Letter; Kinds of Business Letter; Essentials of effective Business Letter - Language and Layout - Planning the Letters - Enquiries and Replies - Sales Letter - Orders, Tender and Notice - Complaints - Letter of Appointment, Business Negotiations, E-Correspondence.

Unit-3

Report Writing: Meaning and Importance of Reports - Purpose of a Report - Types of Business Reports - Characteristics of a Good Report - Preparing a Report - Report by Individual and Committees - Agenda and Minutes of Meeting, Reports on Field Work visits to Industries/Business Concerns etc

Unit-4

Spoken English for Business-communication: Presentation of Plans, Objectives; speech:Preparation, Mode of delivery presentation; Addressing the Audience. Oral Talking.Strategies to overcome Barriers in Address, speech.

Suggested Readings:

1. Namita Gopal, Business Communication, Galgotia Publications Pvt., Ltd.,
New Delhi.
2. Shinley Taylor, Communication for Business, Pearson Education, New Delhi.
3. Lesicar & Flatley, Basic Business Communication, Tata McGraw-Hill, publishing Company Limited, New Delhi.
4. Rajeev Kumar, Business Communication, Mahavir Publications, Delhi
5. P.D.Chaturvedi & Mukesh Chathurvedi, Pearson Education.
6. R.C.Sharma & Krishna Mohan, Business Correspondence and Report Writing, Tata McGraw-Hill Publishing Company Limited, New Delhi.

B.Com(Hons.)-Ist Semester w.e.f. session 2019-20
Fundamentals of Economics
Course Code: BCH-104

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-I

Meaning and Nature of Economics; Basic Problems of an Economy, Micro Economics Vs. Macro Economics. Nature and scope of micro economics.
Demand Analysis: Determinants of demand and law of demand, Exceptions of Law of Demand, Elasticity of Demand- Price, Cross and Income Elasticity.
Law of Supply, Elasticity of Supply.

Unit-2

Utility Analysis and Consumer's Equilibrium: Cardinal Approach-Law of Diminishing Marginal Utility, Law of Equi-Marginal Utility.
The Ordinal Approach-Indifference Curve Analysis and Consumer's Equilibrium.

Unit-3

Theory of Production: Law of Variable Proportion, Law of Returns to Scale, Economies and Diseconomies of Scale.
Theory of Cost: Basic Concepts of Cost. Cost Curves-Short Run Cost Curves, Long Run Cost Curves.

Unit-4

Market Structure-Criteria of Market Classification. Meaning of Perfect Competition, Imperfect Competition, Monopoly and Oligopoly Markets. Revenue: Meaning of Revenue –Total Revenue, Marginal Revenue and Average Revenue, Revenue Curves.
Price Determination under Perfect Competition Market.
Equilibrium of Firm and Industry under Perfect Competition

Suggested Readings:

1.M.L.Jhingan, Micro Economics.
Dr.Raj Kumar, Prof. Kuldip Gupta, Business Economics, UDH, Publishing & Distributors P. Ltd, New Delhi.
2. Uddipto Roy, Managerial Economics, Asian Book Private Ltd., New Delhi.
3. R.L.Varshney, K.L.Maheshwari, Managerial Economics, Sultan Chand & Sons.
4. M.L.Trivedi, Managerial Economics, Tata Mcgraw Hill.
5. T.R. Jain, Business Economics, VK Global Publications Pvt. Ltd. New Delhi.

B.Com(Hons.)-Ist Semester w.e.f. session 2019-20
Indian Banking System
Course Code: BCH-105

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Definition of Bank, Commercial Banks-importance, functions and problems of Non-performing Assets, structure of Commercial Banking system in India. Credit Creation: Process of Credit Creation and its Limitations. Banking Sector Reforms and Latest Developments.

Unit-2

Regional Rural Banks, Cooperative Banking in India. Export-Import (EXIM) Bank of India and its functions.

Reserve bank of India: Functions, regulation and control of credit, Monetary policy (Latest).

Unit-3

Determination and Regulation of Interest Rates in India.

Relationship between banker and Customer, Definition of Customer, General Relationship between banker and customer, Obligation of banker, Garnishee order, banker's rights.

Special types of Bankers Customers..

Unit-4.

Financial Institutions an Overview: Meaning; Special characteristics; Broad categories;

Indian Financial Institutions- A profile.

Development Banks: Concept, objectives, and functions of development banks; Operational and promotional activities of development banks; IFCI, ICICI, IDBI, IRBI, SIDBI, NABARD; State Development Banks, State Financial Corporations.

Suggested Readings:

1. M.L.Tannan, revised by C.R. Datta & S.K. Kataria : Banking Law and Practice, Wadhwa & Company, Nagpur
2.. R.K. Gupta : BANKING Law and Practice in 3 Vols.Modern Law Publications.
3. Shekhar, K.C. and Shekhar, Lekshmy , Banking Theories and practices , Vikas Publication
4. J.M. Holden : The Law and Practice of Banking, Universal Law Publishing.
5. Nidhi Garg : Banking and Banking Law (Hindi Medium), Shree Mahavir Book Depot, Publishers.

B.Com(Hons.)-Ist Semester w.e.f. session 2019-20
Basics of Computers
Course Code: BCH-106

Time: 3 Hrs.
Max.Marks:60

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 6 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 12 marks each

Unit- 1

Computer basic concepts: Definition and characteristics of a computer ,Applications of computer Computer Hardware: computer system as information processing system; Computer system differences- types of computer systems, hardware options-CPU, input devices, output devices, storage devices, communication devices, configuration of hardware devices and their applications.

Unit-2

Personal computers: PC and its main components, hardware configuration, CPU and clock speed, RAM and secondary storage devices, other peripherals used with PC; factors influencing PC performance; PC as a virtual office. Introduction to Operating systems: Software, needs, operating systems, System software and application software

Unit-3

Modern Information Technology: Basic idea of Local Area Networks (LAN) and Wide Area Networks (WAN); E-mail; Internet technologies, access devices, concept of a World Wide Web and Internet browsing; Multimedia.

Unit-4

Emerging Trends in IT: Electronic Commerce(E-Commerce), Types of E-Commerce, Advantages and Disadvantages of E-commerce, Application of E-commerce, process in e-commerce, Types of an Electronic Payment System, Security issues in E-commerce, Security Schemes; Electronic data Interchange (EDI); Mobile communication, Bluetooth Communication, Infrared communication, Smart Card.

PRACTICAL 40 Marks

References

1. Date, C.J: An Introduction to Database Systems, Addison Wesley, Massachusetts.
2. Dienes, Sheila S: Microsoft office, Professional for Windows 95; Instant Reference; BPB publication, Delhi.
3. Mansfield, Ron: The Compact Guide to Microsoft office; BPB publication, Delhi.
4. Norton, peter: Working with IBM-PC,BPB Publications Delhi.
5. O'Brian, J.A: Management Information Systems, Tata McGraw Hill, New Delhi
6. Renu Gupta, Computer applications in business, Mahavir Publications, Delhi

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Financial Accounting
Course Code: BCH-201

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The Examiner will set at least THREE numerical questions in the question paper.

Unit-1
Hire Purchase System and Installment Payment Systems,

Unit-2
Joint Ventures Accounts, Royalty Account,

Unit-3
Branch Accounts (including foreign branch) and Departmental Accounts.

Unit-4
Partnership Accounts: Dissolution of partnership firm- insolvency of partners (including Garner v/s Murray Rule), gradual realisation of assets and piecemeal distribution; amalgamation and sale of partnership firms.

Suggested Readings:
1.Gupta R.L. and Radha Swami M., Financial Accounting, Sultan Chand and Sons., New Delhi.
2.Monga J.R., Ahuja Girish and Sehgal Ashok: Financial Accounting, Mayur Paper Back, Noida.
3.Shukla M.C., Grewal T.S. and Gupta S.C.; Advanced Accounts, S. Chand and Company, New Delhi.
4. Goel, D.K., Financial Accounting, Arya Publications, New Delhi
6. Gupta & Chaturvedi, Financial Accounting, Mahavir Publications, Delhi

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Business Statistics
Course Code: BCH-202

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The Examiner will set at least THREE numerical questions in the question paper.

Unit-1

Correlation Analysis – meaning, significance, types and methods, probable error, co-efficient of determination;

Regression analysis – Meaning, equations, lines. Standard error of estimate. Difference between correlation and regression.

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Unit-2

Time series - components, models, trend analysis including second degree parabola and exponential formula measurement of seasonal cyclical and irregular variations, shifting the trend origin.

Unit-3

Probability and Expected Value: Meaning and Schools of thoughts, Uses of Probability; Calculation of Probability in Business ,Probability Theorems: Addition, Multiplication and Bayes' Theorem. Mathematical Expectations. Numerical of Probability.

Probability Distribution: Binomial, Poisson & Normal distribution

Unit-4

Statistical Quality Control- Process Control, use of Control Charts and Acceptance Sampling. Vital Statistics- Uses, methods of obtaining vital statistics, measurement of fertility, reproduction rates and mortality rate, use of life tables

Suggested Readings:

1 . Dr.S.P.Gupta, Statistical methods, S.Chand & Co., New Delhi.
2. D.N.Elhance, Veena Elhance, B.M.Aggarwal, Fundamentals of Statistics, Kitab Mahal.
3. R.P.Hooda, Statistics for Business and Economics, Mcmillan India Ltd., New Delhi.
4. N.P.Aggarwal, Quantitative Techniques, Ramesh Book Depot., Jaipur
5.Ishwar Sharma, Statistical Analysis, Mahavir Book Depot, New Sarak, Delhi

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Principles of Management
Course Code: BCH-203

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Nature and Functions of Management - Importance and Process of Management - Historical Roots of Contemporary Management Practices, Development of Management Thoughts-Classical, Neo-classical, Systems, contingency and Contemporary Approach to Management Managerial Roles: Role of a Manager - Levels of Management - Managerial Skills - Social Responsibilities of Business.

Unit-2

Nature and Importance of Planning -Types of Plans - Steps in Planning-Making Planning Effective - Strategic Considerations in Planning - Management by Objectives - Decision Making: Rationality in Decision Making - Decision Making and MIS - Forecasting: Techniques of Forecasting.

Unit-3

Need for Organization - Principles and Process of Organizing - Span of Management - Organization Structure - Contemporary Organizational Formats – Project, Matrix and Networking Variables affecting Structure - Departmentalization - Authority, Delegation and Decentralization - Committees.

Unit-4

Staffing and Directing: Staffing as a Function of Management – Motivation – Concept and Theories: Maslow, Herzberg, McGregor, and Ouchi; Leadership, Concept and Theories: Leadership Continuum, Managerial Grid, Situational Leadership, Transactional and Transformational leadership. Co-Ordination and Control- Need for Co-Ordination - Principles and Techniques of Co-ordination - Control: Need for Control - Steps in Control Process - Control Techniques.

Suggested Readings:

1. Harold Koontz & Heinz Weihrich, Essentials of Management, Tata Mcgraw Hill
2. J.S. Chandan, Management Concepts and Strategies, Vikas Publishing House Private Limited, Delhi
3. Nirmal Singh – Principles of Management – Deep & Deep Publications, Pvt. Ltd. Rajouri Garden, New Delhi.
4. Stephen F.Robbins Mary Coulter– Management – Prentice Hall of India Pvt. Ltd
5. F.C.Sharma, Business Management, Mahavir Publications, Delhi.

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Business Economics
Course Code: BCH-204

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-I

Price Determination and Equilibrium of Firm under Monopoly. Price Discrimination-Meaning, Types and its effect.

Price Determination and Equilibrium of Firm under Monopolistic Competition.

Unit-2

Oligopoly Market: Characteristics of Oligopoly, Price and Output Determination under Oligopoly. Price Rigidity and Kinked Demand Curve, Collusive Oligopoly.

Pricing Practices: Cost-Plus Pricing, Marginal Cost Pricing, Rate of Return (or Target) Pricing, Going Rate Pricing, Customary Pricing, Cyclical Pricing, Administered Pricing, Dual Pricing, Psychological Pricing, Limit Pricing, Peak Load Pricing, Pricing over the Life Cycle of the Product.

Unit-3

Nature and Scope of Macroeconomics,Theory of Factor Pricing: Various Factors of Production and their Characteristics, Marginal Productivity Theory and Modern Productivity Theory of Distribution.

Circular flow of income; National Income Accounting– alternative concepts and the measures of National Income.

Unit-4

Inflation-Meaning, Inflationary Gap. Types of Inflation, Cost Push and Demand Pull Inflation, Causes and Control of Inflation.

Trade Cycle- Meaning and Causes of trade cycles. Different Phases of Trade Cycles.

Suggested Readings:

1. M.L.Jhingan, Micro Economics.
2.Raj Kumar &Kuldip Gupta, Business Economics, UDH, Publishing &Distributors P. Ltd, New Delhi.
3. Uddipto Roy, Managerial Economics, Asian Book Private Ltd., New Delhi.
4. R.L.Varshney, K.L.Maheshwari, Managerial Economics, Sultan Chand & Sons.
5. M.L.Trivedi, Managerial Economics, Tata Mcgraw Hill.
6. T.R. Jain, Business Economics, VK Global Publications Pvt. Ltd. New Delhi

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Fundamentals of Insurance
Course Code: BCH-205

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Origin and development of insurance sector: Insurance- Meaning; Importance; Nature, Main principles of Insurance - Principles of Cooperation, Probability, at most good faith. Proximate cause, Insurable interest, Indemnity, Subrogation, Warranty.

Unit-2

Life Insurance: - Main Elements, Importance, Popular life Insurance Policies and plans, Term Insurance Plans Vs. Endowment Plans. Annuities, Premium determination under life Insurance.
Agriculture Insurance: History, Meaning, Main problems, Policies and latest developments.

Unit- 3

General Insurance, Marine Insurance- Main Elements, Marine Losses, Types of Marine Insurance policies.
Fire Insurance- Elements, Premium Determination, Types of Policies. Important Provisions of Moter Insurance, Aircraft Insurance

Unit-4

Risk management in Insurance Sector, Investment patterns and policies of insurance companies, challenges of insurance marketing. Pension Funds in India.
Role of IRDA in Insurance Sector. Latest reforms and developments in Insurance Sector.

Suggested Readings:

1. Black, Kenneth jr. & Skipper, Harold D. jr., Life and Health Insurance, Pearson Education, Delhi
2. Rejda, George E, Principles of Risk Management and Insurance, Pearson Education, Delhi
3. . Financial Intermediation, Indian Institute of Banking and Finance
4. Trieschmann, Risk Management & Insurance, Thomson Learning

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20
Computer Applications in Business
Course Code: BCH-206

Time: 3 Hrs.
Max.Marks:60

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 6 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 12 marks each

Course Inputs

Unit-1

Word processing: Introduction and working with MS-Word in MS-Office; Word basic commands; Formatting-text and documents; Sorting and tables; Working with graphics; Introduction to mail merge.

Unit-2

Spread Sheets: Working with EXCEL-formatting, functions, chart features; Working with graphics in Excel; Using worksheets as database in accounting, marketing, finance and personnel areas.

Unit-3.

Presentation with Power-Point: Power-point basics, creating presentations the easy way; Working with graphics in Power-Point; show time, sound effects and animation effects.

Unit-4.

Introduction to Accounting Packages: Preparation of vouchers, invoice and salary statements; Maintenance of inventory records; Maintenance of accounting books and final accounts; financial reports generation. Practical knowledge on Wings accounting and wings Trade (Softwares), Talley etc

COMPUTER PRACTICAL: 40 MARKS

Suggested Readings:

1. Date, C.J: An Introduction to Database Systems, Addison Wesley,
Massachusetts
2. Dienes, Sheila S: Microsoft office, Professional for Windows 95; Instant
Reference; BPB publication, Delhi.**References**
1. Date, C.J: An Introduction to Database Systems, Addison Wesley, Massachusetts.
2. Dienes, Sheila S: Microsoft office, Professional for Windows 95; Instant Reference; BPB publication, Delhi.
3. Mansfield, Ron: The Compact Guide to Microsoft office; BPB publication, Delhi.
4. Norton, peter: Working with IBM-PC,BPB Publications Delhi.
5. O'Brian, J.A: Management Information Systems, Tata McGraw Hill, New Delhi
6. Renu Gupta, Computer applications in business, Mahavir Publications, Delhi

B.Com(Hons.)-2nd Semester w.e.f. session 2019-20

ENVIRONMENTAL STUDIES

FOUNDATION COURSE (FC)

Course Code: BCH-208

Time: 3 Hrs.

Total Credits:02 **Max.Marks:100**

L - T - P **Ext. Marks, Theory: 80**

2 -0 - 0 **Internal Marks : 20**

Note: There will be 09 questions in all. The question no. 01 is compulsory consisting of 08 short answer questions covering the whole syllabus. The remaining 08 questions will be from Unit 1 to Unit 7. The students are required to attempt any four questions out of these eight questions. All questions carry equal marks.

Unit 1: The Multidisciplinary Nature of Environmental Studies:

Definition, scope and importance, Need for public awareness

Unit 2: Natural Resources:

Renewable and Non-renewable Resources: Natural resources and associated problems.**Forest resources**: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people; **Water resources**: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems; **Mineral resources**: Use and exploitation, environmental effects of extracting and using mineral resources, case studies; **Food resources**: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, Case studies; **Energy resources**: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies; **Land resources**: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit 3: Ecosystems:

Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estauries).

Unit 4: Biodiversity and Its Conservation

Introduction, definition: genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

Unit 5: Environmental Pollution
Definition. Causes, effects and control measures of Air pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear Hazards. Solid waste management: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Diaster management: Foods, earthquake, cyclone and landslides.

Unit 6: Social Issues and the Environment: From unsustainable to sustainable development.
Urban problems related to energy. Water conservation, rain water harvesting, watershed management. Resettlement and rahabilitation of people; its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

Unit 7: Human Population and the Environment
Population growth, variation among nations. Population explosion—Family Welfare Programme. Environment and human health. Human rights. Value education. Value education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in environment and human health. Case Studies.

Unit 8: Field Work
Visit to a local area to document environmental assets—river/forest/grassland/hill/ mountain. Visit to a local polluted site—Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds. Study of simple ecosystems—pond, river, hill slopes, etc.

B.Com(Hons.) 3rd Semester w.e.f. 2020-21
Corporate Accounting-1
Course Code: BCH-301

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit –1
Issue and forefeiture of shares ; Redemption of Preference Shares ; Buy back of Shares.

Unit-2
Valuation of Goodwill; Valuation of Securities; Issue and Redemption of Debentures.

Unit-3
Amalgamation and Internal Reconstruction of Companies as per AS-14.

Unit-4

Holding Companies Accounts ; Profit or loss prior and subsequent to incorporation.

Suggested Readings:
1. Shukla M.C, Grewal T.S and Gupta S.C. ***Advance Accounts***: S.Chand & comp., New Delhi.
2. Gupta R.L & Radha Swami M. ***Company Account***: Sultan Chand, New Delhi.
3. Monga J.R ,.Ahuja Girish and sehgal Ashok ***Financial Accounting***: Mayur paper backs, Noida

B.Com Hons. 3rd Semester w.e.f. 2020-21
Cost Accounting-1
Course Code: BCH-302

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit-1
Cost Accounting: Meaning, nature, scope and limitations; Concept of cost- Elements of Cost and classification, Types of costing.
Costing for Material-Purchase Procedure, Stores Control and Pricing of Material Issues inventory control techniques. Material Losses.

Unit-2
Labour Cost: Idle time, Overtime, Labour turnover, Labour cost control, incentive wage plans.
Overheads: Meaning, Classification, Allocation, Apportionment and Absorption of overheads.

Unit-3
Machine Hour Rate Methods, Unit or Output Costing Costing, Determination of Tender Price.

Unit-4
Contract Costing, Job and Batch Costing, Reconciliation of cost and Financial Accounts.

Suggested Reading:
1. Maheshwari S.N.& Mittal S.N. ***Cost Accounting*** Shree Mahavir Book Depot,Delhi.
2. Jain S.P.& Narang K.L ***Cost Accounting-Principles & Practice*** Kalyani publishers
3. Sexena & Vashisth, Cost accounting
4. Aggrawal, M.L. Cost Accounting, Sahitiya Bhawan Publications Agra.
5. Gupta S.P. Cost Accounting, VK Global Publications Pvt. Ltd. Delhi

B.Com. Hons. 3rd Semester w.e.f. 2020-21
Company Law-1
Course Code: BCH-303

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-I

Concept of corporate body; Advantages of company, features of company, types of company; Privileges of private company; Conversion of private company into public company and vice versa; Formation of company.

Unit-2

Memorandum of Association- meaning, importance, clauses of memorandum of association and their alteration; Doctrine of ultra - vires. Articles of Association- meaning, contents, alteration of articles of association; Constructive notice and doctrine of indoor management.

Unit-3

Prospectus- Definition, contents of prospectus; Statement in lieu of prospectus; Misstatement in prospectus and its consequences. Share Capital- Types of Share Capital, Alteration of share capital, Reduction of Share Capital; Share and Stock.

Unit-4

Application and Allotment of Shares; Shares certificate and Share Warrant; Calls & Forefeiture. Shareholders & Members: - Difference between members and shareholders, modes of acquiring membership in a company, termination of membership; Who may be a member? Register of members, Rights and liabilities of members.

Suggested Readings:

1. Kuchal M.C. Modern Indian Company Law Shri Mahavir Books, Noida.
2. Kapoor N.D. Company Law Incorporating the provisions of the companies Amendment Act.
3. Singh Avtar Company Law Eastern Book Company, Lucknow.

B.Com. (Hons.) 3rd Sem.,w.e.f. 2020-21
Indian Economy
Course Code: BCH-304

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Introduction of Indian Economy: Nature and Characteristics of Indian economy; Features of Indian economy;. Basic economic indicators-National income, performance of different sectors. Trends in prices and money supply.

Unit-2

Institutional structure: Land-reforms in India; role of agriculture in Indian Economy, nature of Indian's agriculture. Agriculture marketing in India. Issues in food security - policies for sustainable agriculture; Agricultural finance policy; Agricultural price policy.
Land acquisition, SEZ and industralisation

Unit-3

Study of Indian Demography: Meaning of population Explosion, India's population: Size and Growth Trends, Causes of their Rapid Growth of Population , Malthusian theory of population, optimum theory of population, theory of demographic transition .Concepts of Demography-Vital rates, life tables, composition and uses.

Demographic features and Human Resource Development in India, Problems of Poverty, Unemployment, income inequality and regional imbalance, Black money in India.

Unit-4

Economic planning: Planning Commission and its functions, Planning exercises in India, Planning commission v/s NITI Aayog, Industrial Policies,Industrial finance; Industrial labour
EXIM Policy and FDI in India.

Suggested Readings:

- Bardhan. P.K. (9th Edition) (1999), The Political Economy of Development in India, Oxford University Press, New Delhi.
- Brahmanada, P.R. and V.R. Panchmukhi (Eds.) (2001), Development Experience in the Indian Economy: Inter-State Perspectives, Bookwell, Delhi.
- Datta, R. and KP.M. Sundhram (2003), Indian Economy. S. Chand & Company Ltd. New Delhi.
- Government of India, Economic Survey, (AnnuaJ), Ministry of Finance, New Delhi.
- Mishra, S.K and V.K Puri Indian Economy- 151 Development Experience, Himalaya Publishing House, Mumbai, Latest Edition.
- Economic Surveys, Governrnnet of India, various issues.
- Reserve Bank ofIndia, Report on Currency and Finance (Annual).
- Indian economy –Rudar Datt and K.P.M Sundharam (S Chand ,New Delhi)

B.Com. (Hons.) 3rd Sem.,w.e.f. 2020-21
Principles of Marketing
Course Code: BCH-305

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-I
Introduction to Marketing: meaning, nature, scope, importance, Product vs Services - Evolution of Marketing, Marketing concepts: -traditional and modern
Consumer Behaviour: nature, scope and significance of consumer behaviour. Factors influencing consumer behavior - Buying decision process - Organisational buying - Value creation to consumer

Unit-2
Market Segmentation & Product:
Market Segmentation: concept, importance, basis for market segmentation, Targeting, Positioning.
Product: concept, planning and development; New Product Development, Branding, Packaging, labeling trade-mark, product life cycle.

Unit-3
Pricing & Distribution channel:
Pricing: meaning, importance, factors affecting product pricing, Pricing policies and Strategies.
Distribution Channel: concept, role, types and factors affecting choice of a distribution channel. Distribution - direct and indirect channel - retailing and wholesaling - channel decision.

Unit-4
Promotion: Promotion mix, sales promotion- meaning & methods, tools, techniques
Advertising: concept, importance, salient features of an effective advertising, designing copy - media selection Personal selling.

Suggested reading:
1. Kotler Philip ***Marketing Management*** Prentice Hall of India New Delhi,1986
2. Pride Willian M and Ferrel O.C. ***Marketting*** Houghton-Mifflin Boston
3. Stantan W.J., Etzel Michael J. and Walker Bruce J. ***Fundamentals of Marketing*** Mc Graw-Hill, New York.

B.Com. Hons. 3rd Semester w.e.f. 2020-21
Business Mathematics
Course Code: BCH-306

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The Examiner will set at least THREE numerical questions in the question paper.

Unit-1

Compound Interest and Annuities: certain different types of interest rates, concept of present value and amount of a sum; types of annuities; present value and amount of an annuity, including the case of continuous compounding; valuation of simple loans and debentures; problems relating to sinking funds.

Unit-2

Matrices and Determinants: definition of a matrix; types of matrices; algebra of matrices; properties of determinants; calculation of values of determinants upto third order, adjoint of a matrix, elementary row or column operations; Finding inverse of a matrix through adjoint and elementary row or column operations; solution of a system of linear equations having unique solution and involving not more than three variables.

Unit-3

Permutation and combination
Sequences and Series: arithmetic and geometric progression
Set theory

Unit-4

Linear Programming-formulation of LPP: Graphical method of solution; problems relating to two variables including the case of mixed constraints; cases having no solution, multiple solutions; unbounded solution and redundant constraints; simplex method - solution of problems up to three variables, including cases of mixed constraints, duality in L.P.P.

B.Com. Hons. 4th Semester w.e.f. 2020-21
Corporate Accounting-II
BCH-401

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit-1
Final Accounts of a company as per schedule VI; Investment Accounts.

Unit-2
Accounts of Banking Companies, Underwriting of shares and debentures.

Unit-3
Accounts of Insurance Companies; Liquidation of companies.

Unit-4
Double Account System, Accounts of Electricity Companies.

Suggested Readings:
1 .Shukla M.C, Grewal T.S and Gupta S.C ***Advance Accounts***: S.Chand and Comp., New Delhi.
2. Gupta R.L & Radha Swami M. ***Company Accounts***: Sultan Chand and sons, New Delhi.
4. Monga J.R. ,Ahuja Girish and Sehgal Ashok ***Financial Accounting***: Mayur Paper Bags, Noida.

B.Com. Hons. 4th Semester w.e.f. 2020-21
Cost Accounting-II
BCH-402

Time: 3 Hrs.
Max.Marks:80

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit-1

Process Costing-Normal and Abnormal losses, Inter Process Profit, Work in Progress and Equivalent Production, Costing for Joint Products and By-Products.

Unit-2

Operating or Service Costing-Transport Operating Costing, Power Operating Costing, Hotel Operating Costing.

Budgeting and Budgetory Control-Types of Budgets, Fixed Vs. Flexible Budget, Master Budget.

Unit-3

Cost Control Accounts- Non-Integrated Accounts and Integrated Accounts.

Unit-4

Uniform Costing and Inter-Firm Comparison, Cost Audit.

Suggested Reading:

1. Maheshwari S.N.& Mittal S.N. Cost Accounting Shree Mahavir Book Depot,Delhi.
2. Jain S.P.& Narang K.L Cost Accounting-Principles & Practice Kalyani publishers
3. Sexena & Vashisth, Cost accounting.
4. Aggrawal, M.L. Cost Accounting, Sahitiya Bhawan Publications Agra.
5. Gupta S.P. Cost Accounting, VK Global Publications Pvt. Ltd. Delhi.
6. Ishwar Sharma, Cost Accounting and Cost Management Part-1, Shree Mahavir Book Depot,Delhi.

B.Com. Hons. 4th Semester w.e.f. 2020-21
Company Law-II
BCH-403

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Company Meetings and Resolution: Kinds of Company Meetings, Requisites of valid Meeting; proxy; voting; Agenda; Minutes of Meetings. Specimens of notice, Agenda and Minutes. Resolution-meaning and types.

Unit-2

Directors: meaning, numbers of directors, Position, appointment, qualification, disqualification, restrictions on the number of directorship, vacation of office of director, removal of directors, managerial remuneration; powers and duties, liabilities of directors.

Unit-3

Company Secretary: Meaning of company secretary, qualifications, qualities, functions, position, role and importance of company secretary, Appointment, powers and rights, duties and liabilities of company secretary.

Unit-4

Winding Up: meaning, compulsory winding up; voluntary winding up, winding up under the supervision of Court, consequences of winding up.

Limited Liability Partnership: Structure and procedure of formation of LLP in India

Suggested Readings:

Kuchal M.C. Modern Indian Company Law Shri Mahavir Books, Noida.
Kapoor N.D. Company Law Incorporating the provisions of the companies Amendment Act.
Singh Avtar Company Law Eastern Book Company, Lucknow.

B.Com. Hons. 4th Semester w.e.f. 2020-21
Goods and Services Tax
BCH-404

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit -1
Goods and Services Tax (GST): Meaning and Introduction, World Wide GST, GST Vs. Old Indirect Tax System, Justification of GST, Requirement of One Nation One Tax, Objectives, Opportunities and Challenges, Taxable Person under GST. Important definitions

Unit-2
GST Models in India: CGST, SGST, IGST;
Supply under GST- Meaning and Scope of Supply , Composite and Mixed Supply, Time of Supply or Services, Place of Supply, Valuation rules for supply, Exempted Goods and Services.

Unit-3
Rates of GST, Functioning of GST with examples- Manufacturer, Wholesalers and Retailer. Input Tax Credit (ITC), Concept of IGST, GST on Import and Export. Latest reforms and developments in GST.

Unit-4
Registration under GST, Filing Returns, GST Administration, Offences and Penalties, Appeals and Revision, Use of Information Technology in GST.

Suggested reading:-
1. The Central Goods and Services Tax Act, 2017.
2. Goods and Services Tax- Parveen Gupta and R.K. Tyagi, SBPD Publishing House, Agra
3. GST and Custom Law- Anoop Modi and Mahesh Gupta, SBPD Publication, Agra
4. Goods and Services Tax including Customs Duty Act- Prof. C.K. Shah and Prof. S.K. Mangal, RBD Publishing House, Jaipur
5. Goods and Services Tax (GST) – Dr. H.C. Mahrotra and Prof. V.P. Aggarwal, Sahitya Bhawan Publications.

B.Com(Hons.)-4th Semester w.e.f. session 2020-21
Human Resource Management
(BCH-405)

Max.Marks:80
Time: 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Human Resource Management (HRM): Definition, Importance objectives and scope.
Function of Human Resource Manager: - Managerial and Operative Functions. Qualifiction and Qualities of Human Resource manager. HRM in India.

Unit-2

Recruitment: - Meaning, Steps in recruitment policy, sources and modes of recruitment, Factors affecting recruitment.
Selection: - Meaning, Essentials of Selection Procedure, Stages in Selection Procedure.
Training: - Concept, Need and importance of Training. Methods of Training, Training Programme in India.

Unit-3

Wages: - Meaning, Methods of wage Programme: - Time wages and Piece wages methods
Wage Incentives: - Concept, Need and Importance of Incentives. Special Incentives Profit sharing and Labour Co-Partnership, Non Monetary Incentives, Essentials of Ideal Incentives system.

Unit- 4

Industrial Relations: - Concept, Importance and Objectives of industrial relations,
Contents of industrial relations. Participants of Industrial relation and Recruitment of good Industrial relation Programme.
Industrial Unrest**: -** Meaning, Forms and Causes of industrial disputes, Reconciliation of Industrial unrest.

Suggested Readings:

1. Human Resource Management: Concepts and Issues, by T.N. Chhabra, Dhanpat Rai & Co. New Delhi.
2. Human Resource Management by R. Wayne Mondy, Pearson Publications, Delhi.
3. Human Resource Management by C.B. Gupta.

B.Com. (Hons.) 4th Sem.,w.e.f. 2020-21
Auditing
BCH-406

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1
Auditing: Meaning, objectives, importance and types of Auditing,
Audit Process: internal control, internal check & internal audit, audit programme.

Unit-2
Audit Procedure: Routine checking, vouching, verification & valuation of assets & liabilities.

Unit-3
Audit of Public company: Qualification, Appointment and Remuneration of company Auditors, their powers, duties and liabilities,
Audit of depreciation and reserves, Divisible profits & dividends.

Unit-4
Audit Report and Investigation
Audit Report: Meaning, objectives, contents and types.
Investigation: meaning, Nature and objectives.

Suggested Readings:
1. Sharma T.R. ***Principles of Auditing*** Sahitya Bhawan Agra.
2. Tondon B.N. ***Principles of Auditing***, S. Chand and Co., New Delhi.
3. Gupta Kamal ***contemporary Auditing*** Tata Mc Graw Hill, New Delhi.
4. Ashok Sharma, ***Auditing,*** V.K. Global Publications Pvt. Ltd. New Delhi.
5. Pardeep Kumar, ***Auditing***, Kalyani Publishers, Ludhiyana

B.Com. Hons. 5th Semester w.e.f. 2021-22
Income Tax
BCH-501

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit-1
Income Tax: An introduction and Important Definitions, Agriculture Income, Residence & Tax Liability (Basis of charge), Exemptions from Tax (Non-Taxable income).

Unit-2
Income from Salaries, Income from House Property.

Unit-3
Profits and Gains from Business or Profession, (Including Depreciation) Capital Gains.

Unit -4
Income from other sources, clubbing of incomes & Aggregation of incomes, set off and carry forward of Losses, Deductions to be made in computing total income.

Suggested Readings:
1. Direct Taxes law & Practice – Dr. H.C.Mehrotra & Dr. S.P. Goyal, Sahitya Bhawan Publications, Agra.
2. Direct Taxes & Practice – Dr. V.K. Singhania Taxmann Publication.
3. Direct Taxes law & Practice – Dr. Bhagwati Prasad – Wishwa Prakashan, N.Delhi.
4. Simplified Approach to income Tax: Dr. Girish ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra.
5. Income Tax : Law and Accounts, P.K.Gupta and N.K.Garg, Sanjay Sahitya Bhawan Agra.

B.Com. Hons. 5th Semester w.e.f. 2021-22
Financial Management
BCH-502

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: The examiner will set at least three numerical questions.

Unit-1
Financial Management: Meaning, Traditional vs. Modern Approach, Functions, scope and objectives.
Financial Planning: Over capitalization and under capitalization.

Unit-2
Cost of capital: Meaning and Significance, Determination of Specific and Overall Cost of Funds, Book Value vs. Market Value Weights.
Leverage analysis: Operating, financial and combined leverage; Financial BEP, Indifference Level of EBIT

Unit-3
Capital Structure: Meaning and determinants, Optimal Capital Structure, Theories of Capital Structure.
Dividend Decisions: Meaning; types of Dividend, Fixed Dividend Policy, Factors Affecting Dividend Decisions of a Firm, Theories of Dividend.

Unit- 4
Working Capital: meaning; nature, determinants, significance, Methods of Forecasting Working Capital Requirements of a Firm.
Management of Cash and Marketable Securities, Techniques of Cash Management.
Receivable Management- Cost of Receivables, Process of Receivable Management

Suggested Readings
1. M.Y.Khan and P.K.Jain 'Financial Management'
2. I.M.Pandey 'Financial Management'
3. Parsana Chandra 'Financial Management Theory and Practice'
4. Ishwar Sharma, Financial Management, Shree Mahavir Book Depot..
5. M.D.Aggarwal, Financial Management, Hindi Medium.
6.S.N.Maheshwari, Financial Management.

B.Com(Hons.)-5th Semester w.e.f. 2021-22
Business Law
(BCH-503)

Max.Marks:80
Time: 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1
The Indian Contract Act 1872: Contract – meaning, characteristics and kinds, essentials of valid contract – offer and acceptance, consideration, contractual capacity, free consent, legality of objects.

Unit-2
Void agreements, Discharge of contract – modes of discharge including and its remedies. Contingent contracts. Quasi – contracts.

Unit-3
Contract of Indemnity and Guarantee, Contract of Bailment, Contract of Agency. Consumer Protection Act.

Unit-4
Sale of Goods Act 1932. Contract of sale, meaning and difference between sale and agreement to sell. Conditions and warranties, Transfer of ownership in goods including sale by non-owners, Performance of contract of sale, unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Suggested Readings:

1. M.C.Kuchhal, Business Laws, Sultan Chand & Co., New Delhi.
2.N.D.Kapoor, Merchantile Law. Sultan Chand & Co., New Delhi
3. L.C.Mittal, Business Law, Mahavir Publications, Delhi
4. Ashok Sharma, Business Regulatory Framework, V.K. Publications, Delhi

B.Com. Hons. 5th Semester w.e.f. 2021-22
Business Environment
BCH-504

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1 Concept of Business Environment and its significance, Elements of environment-internal and external; Techniques of environmental scanning and monitoring.
Consumerism in India; Consumer Protection Act. Competition Policy and Competition Act;

Unit-2 Economic Reforms in India (LPG)-Liberalization, Privatization and Disinvestment of Public Enterprises, Globalization.
Fiscal Policy; Monetary Policy; Problem of NPA in the Banking Sector; SEBI functions,Objectives and Powers;

Unit-3 Government Business Relationship:- Roles of government in business; Economic Implications of Indian Constitution- Preamble, Directive Principles of State Policy, Fundamental Rights, Centre-state relationship; Foreign Investment Policy; FEMA.

Unit-4 Small Scale Industries – Importance, Problems and Policies; Industrial Sickness– problem, magnitude and remedies. Multinational Corporations and its role; EXIM Policy (Latest)
Intellectual Property Rights (IPRs) : Patents, trademarks and copyrights; Emerging issues in intellectual property

Suggested Readings:-

1. S.K.Bedi – Business Environment
2. Fransis Cherunilam – Business Environment – Himalya Publishing House.
3. P.K.Ghosh – Business & Government – Sultan Chand & Sons.
4. Adhikiary, M: Economic Environment of Business, Sultan Chand & Sons, New Delhi.
5. Ahluwalia. I.J. Industrial Growth in India, Oxford University Press, Delhi.
6. Aswathappa, K: Legal environment of Business, Himalaya Publication, delhi.
7. Chakravarty, S: Development Planning, Oxford University Press, Delhi.
8. Ghosh, Biswanath: Economic environment of Business, Vikas Pub, New Delhi.

B.Com. Hons. 5th Semester w.e.f. 2021-22
Financial Marketing Operations
BCH-505

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit–1
Brief Overview of Indian financial system - Financial markets: Money Market Vs.Capital Market.
Money Market: Indian Money Markets : Composition and Structure; Operations and Participants; Acceptance Market, Discount Market, Call money market, Commercial Bills Market, Treasury Bill Market; Money Market Instruments Recent trends in Indian money market.

Unit –2
Capital Market: Primary Market and Secondary market: Concept, Evolution, Functions and Role, Type and Procedure of Issues in New Issue Market;
Stock exchanges: Trading and Settlement, Listing of Securities in Stock Exchange.
Functionaries on stock exchanges: Brokers, Sub brokers, Market makers, Jobbers, Portfolio Consultants, Institutional Investors, Depository System.

Unit –3
Credit Rating: Concept, Functions of Credit Rating, Benefits, Rating Process, Types of Rating, Credit Rating Agencies in India.
Merchant Banking – Functions and Roles, Merchant Banking Vs. Commercial Banking.

Unit –4
SEBI: Role, Powers, Objectives, Scope & Functions.
Investors Protection: Grievances concerning stock exchange and dealings and their removal; grievance cell in stock exchange SEBI: Company law Board: Press remedy through courts.
Mutual Funds: Types, Benefits, Risk Associated with Mutual Funds, General Guidelines for selection of Funds, Reasons for slow growth

Suggested Readings:
1. Chandler M.V. and Goldfield S.M.: Economics of Money and Banking & Harper & Row Newyork.
2. Gupta Sural b: Monetary Planning in India: Oxford, Delhi.
3.Gupta Sural b: Monetary Economics: S.Chand & Co. New Delhi.
4.Bhole L.M.: Financial Market Institutions; Tata Mc Graw-Hill, New Delhi.

OPTIONAL PAPERS (DCEC COURSES) OFFERED IN FIFTH SEMESTER

B.Com. Hons. 5th Semester w.e.f. 2021-22
E-Commerce
(DCEC Course)
BCH-507

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

E-commerce : Introduction, Definition, Evolution, Major areas of Application and Major Issues in Implementing, Traditional Commerce Vs. E-Commerce, Economic Potential, Driving Forces behind E-Commerce, Advantages and Disadvantages of E-Commerce. Obstacles in Success of e E-Commerce, Types of E-Commerce- B2B, B2C,C2B, C2C,B2G, Architectural Framework for E-Commerce.

Business Models: Introduction and Key Components of Business Models, Types of Business Models, e-Shops, e-Procurement, e-Auctions-Basic Operating Rules for e-Auction Participants, Advantages of e-Auction.

Unit -2

Electronic Payment Systems: Introduction, Limitations of Traditional Payment, Comparison of Conventional and Electronic Payment System, Usage of E-Payment Systems, Critical Success Factors, Types of Electronic Payment Systems, Credit Card, Electronic Cheque System, Electronic Cash System, Smart Card, their advantages, disadvantages and comparison, Other Electronic Payments systems-P2P payment, Electronic wallets , E-Banking , Online Fund Transfer, ATM card, Security in Electronic Payments-Encryption, Electronic Certificates, Payment protocols .

Unit-3

Email Marketing- Introduction, Use of Email, Social networking-marketing tool, Social Media, Social Media Marketing-objectives, risks, Viral Marketing-Introduction, The Viral Effect, working, Introduction of E-Retailing and its Components.

Advertisements: Introduction, Web Based Advertising, Types of Web-Based Advertising, Advantage, Disadvantages, Search Engine Advertisements- Advantages and Disadvantages, Search Engine Optimisation (SEO)-SEO Techniques, Advantages, Online Marketing-Introduction, Definition, Importance, types and advantages.

Unit -4

Customer Relationship Management(CRM)-Introduction, Purpose, Levels, Features, Importance, Goals, relation with IT, e-CRM, difference from CRM, Data Mining, Social Media-Types of Social Networking Sites, Data Mining from Social Networking Sites.

Cloud Computing: Introduction and Characteristics, E-Commerce Security and Privacy: Introduction, Online Fraud-Types, Privacy- Privacy Issues, Cyber Laws:- Need of Cyber Laws, Introduction of IT Act 2000.

Suggested Readings:

1. Greenstein and Feinman, "E-Commerce", TMH
2. Ravi Kalakota, Andrew Whinston, "Frontiers of Electronic Commerce", Addision Wesley
3. Denieal Amor, " The E-Business Revolution", Addision Wesley
4. Gupta, Satinder Bal, " IT and E-Commerce", Mahavir Publications, Delhi
5. Bajaj & Nag, "E-Commerce: The Cutting Edge of Business", TMH
6. G.S.V.Murthy, "E-Commerce Concepts, Models, Strategies", Himalaya Publishing House
7. Gray P. Schneider, "Electronic commerce", Pearson.

B.Com. Hons. 5th Semester w.e.f. 2021-22
Retail Management
(DCEC Course)
BCH-508

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1
Introduction to Retailing, Evolution of Retail Environment, growth and present size, retailing mix, Emerging trends in retailing in India. Legal, Security Issues & Ethical Dimensions in Retail

Unit-2
Retail planning & development; Understanding the Retail Customer, Marketing Research for Retailing, Formats of Retailing, Traditional retail formats *vs.* modern emerging retail formats in India;, Retailing models – Franchiser franchisee, directly owned, retailing life cycle

Unit-3
Retail Mix: Product Merchandise, Pricing, Promotion and Communication Mix

Unit-4
Management of Retailing Operations. Sourcing, Financial Management Issues in Retailing, Organization Structure and Management of Human Resources. Issues Impacting Retail Business in India, CRM Customer Relationship Marketing, Monitoring and Controlling Retail Operations

Suggested Readings :
1. Berman, Berry & Evans, Joel & R. : Retail Management : A Strategic Approach, PHI/Pearson Education, New Delhi.
2. Levy Michael & Weitz Barten W. : Retailing Management, Tata McGraw Hill, New Delhi.
3. Newiman, Andrew J. & Cullen, Peter : Retailing Environment & Operations; Vikas Publishing House, NewDelhi.
4. Duane: Retailing Thomson Leaming, Mumbai.
5. Gilber, David : Retail Marketing Management, Paerson Education, New Delhi.
6. Diamond, Jay and Gerald Pintel : Retailing, Prentice-Hall, NJ, 1996.
7. Morgenstein, Melvin and Harriat : Strong in Modern Retailing, Prentice-Hall, NJ,1992.

B.Com. Hons. 5th Semester w.e.f. 2021-22
Business Ethics
(DCEC Course)
BCH-509

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1

Business Ethics – Concept, Characteristics, Importance and Need for business ethics. Indian Ethos, Ethics and Values, Work Ethos, Ethical decision making in business –models and processes, personal and corporate values and ethical decision making. Globalization and business ethics; Creating an ethical organization – corporate governance, corporate culture, CSR, code of conduct. Sources of Ethics, Concept of Corporate Ethics, Code of Ethics-Guidelines for developing code of ethics, Ethics Management Programme, Ethics Committee.

Unit-2

Various approaches to Business Ethics - Theories of Ethics- Friedman's Economic theory, Kant's Deontological theory, Mill & Bentham's Utilitarianism theory , Gandhian Approach in Management and Trusteeship, Importance and relevance of trusteeship principle in Modern Business, Gandhi's Doctrine of Satya and Ahimsa, Emergence of new values in Indian Industries after economic reforms of 1991 .

Unit-3

Indian Ethical Practices: Ethics in Marketing and Advertising, Human Resources Management, Finance and Accounting, Production, Information Technology, Copyrights and, Employment, Gender Discrimination.

Unit-4

Broader ethical issues in society-- corruption, ecological concerns, discrimination on the basis of gender, caste or race; ethics and information technology, impact of Govt. policies and laws on ethics, resolving ethical dilemmas.

Suggested Readings:

- Sekhar, R.C., Ethical Choices in Business, Response Books, New Delhi, 1997.
- S.K.Chakraborty, Managerial Transformation by Values, Sage Publications, New Delhi, 1993.
- Campbell Jones, Martin Parker & Rene ten Bos (2005) For Business Ethics, Routledge, New York
- Fernando A.C. (2009) Business Ethics: An Indian Perspective, Pearson Education, New Delhi
- R.C. Sekhar, Ethical choices in Business, Sage Publications, New Delhi
- Business Ethics, Andrew Crane and Dirk Matten, Oxford University Press.
- Business Ethics, Text and Cases, C.S.V. Murthy, Himalaya Publication House.

CORE COURSES (CC):

SIXTH SEMESTER

B.Com. Hons. 6th Semester w.e.f.2021-22
Income Tax Law & Administration
BCH-601

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit – I
Rebate & Relief of Tax, computation of Total income of individuals, computation of Tax liability of individuals.

Unit – 2
Assessment of Hindu Un-divided Families, Assessment of firms & Association of persons.

Unit – 3
Income Tax Authorities & their powers, procedure for assessment, Deduction of Tax at source (TDS) Advance payment of Tax. Filing of online Income Tax Returns (ITR – I and II)

Unit – 4
Recovery & Refund of Tax, Appeals & Revision, Penalties, Offences & Prosecutions. Concept of Tax Planning, Tax Planning Vs. Tax Evasion, Need of Tax Planning.

Suggested Readings:
1. Direct Taxes Law & Practice : Dr. H C Mehrotra & Dr. S P Goyal, Sahitya Bhawan Publications, Agra.
2. Direct Taxes & Practice : Dr. V K Singhania, Taxman Publications.
3. Direct Taxes Law & Practice : Dr. Bhagwati Prasad, Wishva Prakashan, New Delhi
4. Simplified Approach to Income Tax : Dr. Girish Ahuja & Dr. Ravi Gupta – Sahitya Bhawan Publishes & Distributors, Agra
5. Income Tax : Law and Accounts, P.K.Gupta and N.K.Garg, Sanjay Sahitya Bhawan Agra.

B.Com. Hons. 6th Semester w.e.f.2021-22
Accounting for Managers
BCH-602

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Important: *The Examiner Shall Set at least Three Numerical Questions in Question Paper.*

Unit-1
Accounting for Managers-Meaning, nature, scope, techniques and limitations. Financial Statements Analysis-Comparative, Common Size and Trend Analysis. Ratio Analysis-Meaning, objectives limitations and types of Ratios.

Unit-2:
Capital Budgeting: Meaning, Nature, Importance, Appraisal methods-Traditional methods and Discounting Cash Flow Techniques, Capital Rationing. Inflation and Capital Budgeting.

Unit-3
Standard Costing- Meaning, Advantages, Limitations, Budgetary Control Vs. Standard Costing. Setting of Standards, Variance analysis-Material Variance, Labour Variance , Overhead Variance and Sales Variances.

Unit-4:
Marginal Costing : Meaning, Marginal Costing and Absorption Costing, Break Even Point (BEP), Break Even Chart and its types. Angle of Incidence. Cost-Volume-Profit Analysis,
Margin of Safety, Concept of Decision Making-Steps involved, Make or Buy Decision, Determination of Sales Mix, Key Factor Problem.

Suggested Readings:

1. S.N. Mittal: Accounting for Managerial Decisions-Shree Mahavir Book Depot, Nai Sarak, Delhi
2. Khan and Jain: Management Accounting-Tata Mcgraw Hill
3. Aggarwal and Aggarwal: Accounting for Managerial Decisions-Ramesh Book Depot, Jaipur.
4. Ravi.M.Kishore: Management Accounting-Taxman Publications Delhi.
5. Ishwar Sharma: Accounting for Managers- Shree Mahavir Book Depot,Nai Sarak Delhi

B.Com(Hons.)-6th Semester w.e.f. session 2021-22
Business Regulatory Framework
(BCH-603)

Max.Marks:80
Time: 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1
Indian Partnership Act 1932: Nature of Partnership firm, Test of Partnership, Partnership distinguishes from co-ownership and Joint Hindu Family, Relations of partners to third parties, Duties and rights of partners; Minor as a partner; Incoming and outgoing Partners; Registration of firms; Dissolution of firm-modes, Consequences of dissolution; Settlement of Accounts

Unit-2
The Factories Act-1948: Approval, Licensing & Registration of Firms, Notice regarding occupier, Inspecting Staff, Certifying Surgeons, Health, Safety and Welfare of Workers. Working hours of Adults, Restrictions on Employment of women. Employment of young persons, Annual leave with Wages. Latest Amendments in the Act.

Unit-3
The Information Technology Act, 2000: Objectives and main provisions; Cyber crimes and penalties
RTI Act : features, rights and importance, Latest Amendments.

Unit-4
Negotiable Instruments Act: - Negotiable Instrument an introduction Promissory notes; Bills of Exchange; cheques, Parties to negotiable Instruments; Discharge of parties from Liability; Dishonour of Negotiable Instruments. Instruments; Presentment of Negotiable Instrument; Negotiation.

Suggested Readings:
1. M.C.Kuchhal, Business Laws, Sultan Chand & Co., New Delhi.
2. N.D.Kapoor, Mercantile Law. Sultan Chand & Co., New Delhi.
3. Ashok Sharma, Mercantile Laws, V.K.Publications, Delhi
4.Business Law, L.C.Mittal, Mahavir Book Depot, Delhi
5. Resai T.R. Partnership Act, S.C.Sarkar and Sons, kolkata

B.Com. Hons. 6th Semester w.e.f.2021-22
International Business
BCH-604

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit – I

International Business: - An overview; Domestic versus International Business; Major risks and challenges of International Business; International Business Environment- Components and determinants; stages of internationalization of business; international business approaches, concept of globalization. Modes of entering into international business

Unit – II

Foreign market entry strategies; country evaluation and selection; factors affecting foreign investment decisions; impact of FDI on home and host countries; types and motives for foreign collaboration; control mechanisms in international Business, India's FDI policy; foreign exchange; Balance of payments;

Unit – III

Global Trading and Investment Environment: World trade in goods and services –Major trends and developments; World trade and protectionism –Tariff and non-tariff barriers; Government intervention in international trade; India's foreign trade policy

Unit – IV

Regional Economic Integration: Levels of Regional Economic Integration; Trade creation and diversion effects; Regional Trade Agreements: European Union (EU), ASEAN, SAARC, NAFTA, International Economic institutions: IMF, World Bank, UNCTAD
World Trade Organisation (WTO): Functions and objectives of WTO; Agriculture Agreement; GATS; TRIPS; TRIMS, Corporate social responsibility (CSR)

Suggested Readings:

1. Daniels, J.D. and H. LEE Radesbaugh, International Business-Environment and Operation (New Delhi; Pearson Education).
2. Hill, Charles W.L., International Business – competency in the Global marketplace (New Delhi: Tata McGraw Hill).
3. Sundram, Anant K and steward J Black, The International Business environment: Text and Cases (New Delhi: Prentice Hall of India).
4. Sharan, V., Internatinal Business: Concept, Environment and strategy (New Delhi: Person Education)
5. Beth V. Yarbrough and Robert H.Yarbrough, The World Economy – Trade and Finance, Thomson Leaning, Singapore

B.Com. Hons. 6th Semester w.e.f.2021-22
Investment Analysis
BCH-605

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit-1
Investment: Meaning and process. Investment vs. Speculation, Investment vs. Gambling. Investment avenues.
Risk Return Analysis : Types and Measurement

Unit-2
Stock Exchanges in India: Trading mechanism and Indices of Bombay Stock Exchange and National Stock Exchange. Listing of Securities and its process.

Unit-3
Fundamental Analysis: Economy, Industry and Company Analysis; Estimation of Intrinsic Value.
Option Contracts: Meaning and Types (Only Elementary Introduction).

Unit-4
Technical Analysis: Dow theory, Charting techniques, Technical v/s Fundamental analysis.
Overview of Efficient Market Theory or Hypothesis.

Suggested Readings

1. V. A. Avadhani, Investment and Securities Market in India, Himalaya Publishing House.
2. Preeti Singh, Investment Management, Himalaya Publishing House
3. Dhanesh Khatri, Security Analysis and Portfolio Management, Macmillan Ltd
4. Punithavathy Pandian, Security Analysis and Portfolio Management, Vikas Publishing House Pvt. Ltd. Noida/New Delhi

OPTIONAL PAPERS (DCEC COURSES) OFFERED IN SIXTH SEMESTER

B.Com. Hons. 6th Semester w.e.f. 2021-22
Contemporary Issues in Commerce
DCEC Course
BCH-607

Max. Marks 60
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 6 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 12 marks each

UNIT-1

General Issues Balance of Payment and Deficit Financing, Tax Regulations & Economic Growth,Role of Micro Finance in Rural Development, Corporate Social Responsibility: Ethics and Accountability Information and Communication Technology: E- Learning : An Effective Tool in Present Educational Scenario, Mobile Communication : A Revolutionary tool in I.T.

UNIT-2

Finance Issues Financial Innovations, Global Financial Crisis, Recent trends in Banking and Financial Services

UNIT-3

Marketing Issues Reshaping Rural Marketing; Modern Retailing Challenges in India, Marketing through Social Networking Websites, Evolving E- Marketing in India

UNIT-4

Human Resource Issues Challenges in Managing Workforce Diversity, Human Resource Accounting and Audit, HR challenges in Managing Technological Changes

PROJECT REPORT: 20 MARKS

NOTE: Report on Contemporary Issues in Commerce is required to be submitted by the students at the end of the semester as per guidelines given in the scheme of examination. The Report shall carry 20 marks.

Suggested Reading:

Tej Singh & Parul Mittal : Contemporary issues in Commerce, Kalyani Publications.

B.Com. Hons. 6th Semester w.e.f. 2021-22
International Marketing
DCEC Course
BCH-608

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit -1
International Marketing:
Nature and Concept; Domestic Vs International Marketing; Opportunities and Challenges for marketing in International Environment ; Foreign market selection and entry modes.

Unit -2
Product Planning and Pricing:
International product life cycle research and informations; Product designing and packaging; Pricing process and methods; International price quotations and payment terms.

Unit-3
International Distribution:
Channel structure and selection decisions; Managing channel conflicts; Selection and appointment of foreign sales agents; Basic export procedure and documentation.

Unit -4
Product Promotion:
Methods of International product Promotion; challenges in International advertising and media strategy; Web marketing; Organising trade fairs and exhibitions.

Suggested Readings:
1. Bhattacharya R.L and Varshney B: International Marketing Management: Sultan Chand, New Delhi.
2. Keegan W.J, Multinational Marketing Management, Prentice Hall, New Delhi.
3. Kotler Phillip: Moder Mott M.C: The Essence of International Business, Prentice Hall, New Delhi.
4. Caterora P.M. and Keavenay S.M: Marketing and International Perspective, Ervind Homewood Illinois.

B.Com. Hons. 6th Semester w.e.f. 2021-22
Income Tax Planning
DCEC Course
BCH-609

Max. Marks 80
Time 3 Hrs.

Note: The examiner shall set nine questions in all covering the whole syllabus. Question No.1 will be compulsory and consist 8 small questions of two marks each, covering the whole syllabus. The remaining 8 questions will be set from the syllabus on two questions from each unit basis; out of which the students will attempt four questions selecting one from each unit. All questions carry 16 marks each

Unit – 1
Concepts of Tax Planning, Tax Evasion, Tax Avoidance, Tax Management Feature of Tax Planning, Need for Tax planning, Precautions in Tax planning, Limitations of Tax planning, Difference between Tax planning, Tax evasion, Tax avoidance, Tax Management.

Unit – 2
Tax planning in relation to residential status and non-residents Tax-planning in relation to Employees remuneration: Tax planning for employer, Tax planning for employees. Tax Planning in relation to income from House Property Tax planning in relation to income from Business & profession.

Unit – 3
Tax planning in relations to income from capital gains and other sources. Tax planning in relation to individuals and H.U.Fs.

Unit –4
Tax planning in relation to partnership firms, Body of Individuals or Associations of Persons. Tax planning in relation to setting up of a new business: Nature and Size of Business, location of Business.

Suggested Readings:
1. Direct Taxes Law & Practice – Dr.H.C.Mehrotra & Dr.S.P.Goyal Sahitya Bhawan Publications, Agra.
2. Corporate Tax Planning & management – Dr.H.C.Mehrota and Dr.S.P.Goyal – Sahitya Bhawan Publications, Agra.
3. Direct Taxes & Practice – Dr.V.K.Singhania Taxman's Pulications

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

SCHEME OF B.A. Part-I (PASS COURSE)

POLITICAL SCIENCE

SEMESTER SYSTEM

B.A.Part –I w.e.f. session 2017-2018

Class	*Nomenclature of Paper*	*Internal Assess.*	*Theory*	*Total Marks*	*Time*
B.A. (Sem. I)	Option (i) Indian Constitution	20	80	100	3 Hrs.
-do-	Option (ii) International Relations-I	20	80	100	3 Hrs.
B.A. (Sem.II)	Option (i) Indian Politics	20	80	100	3 Hrs.
-do-	Option (ii) International Relations-II	20	80	100	3 Hrs.

B.A. Part - II w.e.f. session 2018-19

B.A. (Sem. III)	Option (i) Principles of Political Sciences-I	20	80	100	3 Hrs.
-do-	Option (ii) Indian Political Thinker-I	20	80	100	3 Hrs.
B.A. (Sem.IV)	Option (i) Principles of Political Sciences-II	20	80	100	3 Hrs.
-do-	Option (ii) Indian Political Thinkers-II	20	80	100	3 Hrs.

B.A. Part -III w.e.f. session 2019-20

B.A. (Sem. V)	Option (i) Comparative Politics	20	80	100	3 Hrs.
-do-	Option (ii) International Organization-I	20	80	100	3 Hrs.
B.A. (Sem.VI)	Option (i) Comparative Constitutions of UK & USA	20	80	100	3 Hrs.
-do-	Option (ii) International Organization-II	20	80	100	3 Hrs.

NOTE *:- The students are required to opt only one out of two Optional papers in each Semester.*

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-I, Political Science (Pass Course)
Semester-I

NOTE: There will be two Optional papers. The students will have to opt only one paper out of the two papers. The maximum marks are 100. (Theory 80, Internal Assessment 20).

Option (i) : Indian Constitution

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

UNIT-I

Indian Constitution – Sources and Features, Preamble, Fundamental Rights, Fundamental Duties and Directive Principles of State Policy.

UNIT-II

Union and State Executive – President, Prime Minister, Council of Ministers; State Executive – Governor, Chief Minister and Council of Ministers.

UNIT-III

Union and State Legislature – Parliament-Composition and Functions; Speaker of Lok Sabha Amendment Process; State Legislature-Vidhan Sabha; Panchayati Raj

UNIT-IV

Judiciary – Supreme Court, High Courts, Judicial Review.

Reading:

1. G. Austin, The Indian Constitution: Corner Stone of a Nation, Oxford, Oxford University Press, 1966.
2. D.D. Basu, An Introduction to the Constitution of India, New Delhi, Prentice Hall, 1994.
3. D.D. Basu and B. Parekh (ed.), Crisis and Change in Contemporary India, New Delhi, Sage, 1994.
4. C.P. Bhambhri, The Indian State: Fifty Years, New Delhi, Shipra,1997.
5. P. Brass, Politics of India Since Independence, Hyderabad, Orient Longman, 1990.
6. R. Kothari, Politics in India, New Delhi, Orient Longman, 1970.
7. W.H. Morris Jones, Government and Politics in India, Delhi, BL Publications, 1974.
8. J.R. Siwach, Dynamics of Indian Government & Politics, New Delhi, Sterling Publishers, 1985.

INDIRA GANDHI UNIVERSITY, MEEERPUR, REWARI

B.A. Part-I, Political Science (Pass Course)
Semester-I

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii): International Relations-I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I

Definition, Nature, Scope and Development of International Relations, Autonomy Debate
regarding International Relations.

Unit-II

Approaches and Theories:-
a) Idealist Approach
b) Realist Approach
c) Systems Approach
d) Marxian Approach

Unit-III

National Power : Definition, Elements and Assessment, Limitations on National Power:
International Law, International Morality and World Public Opinion

Unit-IV

Balance of Power, Collective, Security.

Readings

1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War, Dordrecht*, Martinus Nijhoff,1992.
3. S. Burchill et. al., *Theories of International Relations*, Hamsphire, Macmillan, 2001.
4. S.H. Hoffman, *Essays in Theory and Politics of International Relations*, Boulder Colorado, Westview Press, 1989.
5. M.P. Sullivan, *Theories of International Politics: Enduring Paradigm in a Changing World*, Hamsphire, Macmillan, 2001.

INDIRA GANDHI UNIVERSITY, MEERPUR,REWARI
B.A. Part-I, Political Science (Pass Course)
Semester-II

Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Indian Politics

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

UNIT-I

Federalism and its Working with reference to Centre-State Relations, Demand for State
Autonomy; Emerging Trends in Indian Federalism.

UNIT-II

Election Commission, Electoral Process and its Defects and Voting Behaviour, Electoral
Reforms, Problem of Defection.

UNIT-III

Party System in India: National and Regional Political Parties.

UNIT-IV

Role of Caste, Religion, Language, Regionalism in India, Politics of Reservation.

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Reading:

1. D.D. Basu and B. Parekh (ed.), Crisis and Change in Contemporary India, New Delhi, Sage, 1994.
2. P. Brass, Politics of India Since Independence, Hyderabad, Orient Longman, 1990.
3. S. Kaushik (ed.), Indian Government and Politics, Delhi University, Directorate of Hindi Implementation racy and Discontent: India's Growing Crisis ofGovernability, Cambridge, Cambridge University Press, 1991.
4. R. Kothari, Politics in India, New Delhi, Orient Longman, 1970.
5. R. Kothari, Party System and Election Studies, Bombay, Asia Publishing House, 1967.
6. J.R. Siwach, Dynamics of Indian Government & Politics, New Delhi, Sterling Publishers, 1985.
7. R. Thakur, The Government & Politics of India, London, Macmillan, 1995.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-I, Political Science (Pass Course)

Semester-II

Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Option (ii): International Relations-II

Unit-I

Ideology in International Relations, National Interest, Foreign Policy, Diplomacy

Unit-II

Cold War, Non-Alignment, End of Cold War.

Unit-III

Meaning of Disarmament and Arms-control: Types of Disarmament; History of Disarmament: NPT, CTBT.

Unit-IV

New International Economic Order, North-South Dialogue, Globalization.

Readings

1. John, Baylis and Steve Smith, *Globalization of World Politics*, Oxford, London, 1997.
2. P.Allan and K. Goldman (eds.), *The End of the Cold War, Dordrecht*, Martinus Nijhoff, 1992.
3. S. Burchill et. al., *Theories of International Relations*, Hamsphire, Macmillan, 2001.
4. K.W. Deutsch, *The Analysis of International Relations*, New Delhi, Prentice Hall, 1989.
asingstoke, Macmillan, 1999.
5. F. Halliday, *Rethinking International Relations*, Basingstoke, Macmillan, 1994.
7. M.S. Rajan, *Non-Alignment and the Non-Alignment Movement in the Present World Order*, Delhi, Konark, 1994.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)

Semester-III

Syllabi and Courses of Reading

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Principles of Political Science-I

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I

Political Science: Definition, Meaning, Nature and Scope.
Relations of Political Science with other Social Sciences.

Unit-II

State: Definition, Elements, Relations with the other organizations.
Theories of the Origin of the State.

Unit-III

Nature of State: Liberal, Marxian.
Functions of State: Liberal and Socialist Views.
Welfare State: Concept and Functions.

Unit-IV

Sovereignty: Definition, Attributes and Types.
Theories of Sovereignty: Monistic and Pluralistic.

Readings

1. **The Dynamics of Diplomacy, Jean Robert Leguey- Feilleux, Published by (VIVA) Vinod Vasishtha for viva Books Private Ldt., 4732/23 Ansari Road, New Delhi-110002, Printed by Anand Sons, Delhi-100092, First Edition-2010.**
2. **The game of Diplomacy- Richard Sharp, Published in Great Britain by Arthur Barker Ltd. London, 1928**
3. **Diplomacy for the 21st Century, Naunihal Singh, Naurang Rai Mittal Publications (New Delhi) First Edition- 2002.**
4. **Conduct of the New Diplomacy: Jamesh Cany, Marper & Row, New York, Evanstom and London, Copy right-1964.**
5. **Modern Diplomacy: Pialecties and Pinensions, GVG Krishnanmurty, Marinder Sagar, Sagar Publications, New Delhi-110001, 1980.**
6. **Theory and Practice of Diplomacy: Dr. Harish Chander Sharma, College Book Depot, Jaipur, New Delhi.**

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-III

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

(Option-ii) Indian Political Thinkers-I

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I

Raja Ram Mohan Ray and Swami Dayanand,

Unit-II

Dada Bhai Narojee and Gopal Krishan Gokhle

Unit-III

Swami Vivekanand and Aurbind Ghosh

Unit-IV

Lala Lajpat Rai and Bal Gangadhar Tilak

Readings

1. A.S. Altekar, *State and Government in Ancient India*, Delhi, Motilal Banarsidass, 1966.
2. A.Appadorai, *Documents on Political Thought in Modern India*, 2 Vols. Bombay Oxford University Pres, 1970.
3. S. Ghose, *Modern Indian Political Thought*, Delhi, Allied, 1984.
4. V.R. Mehta, *Foundations of Indian Political Thought*, New Delhi, Manohar, 1992.
5. T. Pantham, and K. Deustch (eds), *Political Thought in Modern India*, New Delhi, Sage, 1986.
6. B. Parekh and T. Pantham (eds), *Political Discourse: Exploration in Indian and Western Political Thought*, New Delhi, Sage, 1987.
7. V.R. Mehta, Foundations of Indian Political Thought, New Delhi, Manohar, 1992.

INDIRA GANDHI UNVIERSITY, MEEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-IV

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Principles of Political Science-II

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I

Concepts and Theories of Rights.
Relationships between Rights and duties.
Universal Declaration of Human Rights.

Unit-II

Concept and Theories of Liberty and Equality.
Relationship between Liberty and Equality.

Unit-III

Concepts of Social Change
Concept and Theories and Development.

Unit-IV

RTI and Consumer Protection and Welfare.

Readings

1. **The Dynamics of Diplomacy, Jean Robert Leguey- Feilleux, Published by (VIVA) Vinod Vasishtha for viva Books Private Ldt., 4732/23 Ansari Road, New Delhi-110002, Printed by Anand Sons, Delhi-100092, First Edition-2010.**
2. **The game of Diplomacy- Richard Sharp, Published in Great Britain by Arthur Barker Ltd. London, 1928**
3. **Diplomacy for the 21st Century, Naunihal Singh, Naurang Rai Mittal Publications (New Delhi) First Edition- 2002.**
4. **Conduct of the New Diplomacy: Jamesh Cany, Marper & Row, New York, Evanstom and London, Copy right-1964.**
5. **Modern Diplomacy: Pialecties and Pinensions, GVG Krishnanmurty, Marinder Sagar, Sagar Publications, New Delhi-110001, 1980.**
6. **Theory and Practice of Diplomacy: Dr. Harish Chander Sharma, College Book Depot, Jaipur, New Delhi.**

INDIRA GANDHI UNVIERSITY, MEEERPUR, REWARI

B.A. Part-II, Political Science (Pass Course)
Semester-IV

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : Indian Political Thinkers

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of eight short answer questions of 2 marks each.

Unit-I
Mahatma Gandhi and M.N, Roy

Unit-II
Jawaharlal Nehru and B.R. Ambedkar

Unit-III
Subhash Chander Bose and Bhagat Singh

Unit-IV
J.P. Narayan and Ram Manohar Lohia

Readings

1. A.Appadorai, Indian Political Thinking Through the Ages, Delhi Khanna Publishers, 1992.
2. K.P. Karunakaran, Indian Politics from Dababhai Naoroji to Gandhi : A Study of Political Ideas of Modern India, New Delhi, Gitanjali, 1975.
3. V.R.Mehta, Foundations of Indian Political Thought, New Delhi, Manohar, 1992.
4. V.P. Verma, Modern Indian Political Thought, Agra, Lakshmi Narain Aggarwal, 1974

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)

Semester-V

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i): Comparative Politics

M. Marks: 80
Internal Assessment: 20
Time: 3 Hours

NOTE : Total 10 questions will be set: four each from Part A and Part B and the two from Part C. Candidates will have to attempt five questions in all selecting at least one question from each part. There will be one compulsory multiple choice objective type question.

UNIT-I

Comparative Politics-Definition, Scope; Traditional & Modern Concerns; Comparative Methods.

UNIT-II

Approaches to the Study of Comparative Politics: Input-Out (David Easton), Structural-Function (G. Almond), Political Development, Political Culture (G. Almond).

UNIT-III

Constitutionalism: History, Nature, Type and Problem in Modern Times.

UNIT-IV

Constitutional Structure: (a) Formal-Executive, Legislation and Judiciary, (b) Informal Structures– Political Parties and Pressure Groups.

Readings

1. G.A. Almond and J.S. Coleman, The Politics of the Developing Areas, Princeton NJ, Princeton University Press, 1960.
2. G.A. Almond, and S. Verba, The Civic Culture : Political Attitudes and Democracy in Five Nations, Princeton NJ, Princeton University Press, 1963.
3. L.J.Cantori and A.H. Zeigler (ed.), Comparative Politics in the Post-Behaviouralist Era, London, Lynne Reinner Publisher, 1988.

4. O. Dunleavy and B.O' Leary, Theories of Liberal Democratic State, London, Macmillan, 1987.
5. R. Hauge and M. Harrop, Comparative Government and Politics. An Introduction, 5th edn., New York, Palgrave, 1001.
6. H. Finer, Theory and Practice of Modern Government, London, Methuen, 1969.
7. J.C. Johari, Comparative Political Theory: New Dimensions, Basic Concepts and Major Trends, New Delhi, Sterling, 1987.
8. K. Kumar, Revolution : The Theory and Practice of a European Idea, London, Weidenfeld and Nicolson, 1971.
9. R.C. Macridis, The Study of Comparative Government, New York, Doubleday, 1955.
10. R.C. Macridis and R.E. Ward, Modern Political Systems : Europe, and Asia, 2nd edn. Englewood Cliffs NJ, Prentice Hall, 1968.
11. J. Manor (ed.), Rethinking Third World Politics, London, Longman, 1991.
12. R.C. Macridis, Modern European Governments : Cases in Comparative Policy - Making, Englewood Cliffs NJ, Prentice Hall, 1968.
13. L.W. Pey (ed.), Communication and Political Development, Princeton NJ, Princeton University Press, 1963.
14. R.I. Rotberg (ed.), Politics and Political Change : A Journal of Inter-Disciplinary History Reader, Massachusetts, MIT Press, 1001.
15. H.J. Wiarda (ed.), New Developments in Comparative Politics, Boulder Colorado, Westview Press, 1986.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)
Semester-V

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : International Organization-I

Max. Marks: 80
Internal Assessment: 20
Time: 3 Hrs.

Note: Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of nine short answer questions of 2 marks each.

Unit-I

International Organization: Meaning, Nature and Scope.
Evolution and growth of International Organization.

Unit-II

League of Nations, Structure, Objectives, Functions and Causes of Failure.

Unit-III

U.N.O.: Origins, Objectives and Principles, Membership, Structure and Functions.
Organs of United Nations: General Assembly, Security Councils, Economic and Social Council,
U.N. Secretariat, International Court of Justice

Unit: IV

Specialized Agencies of the United Nations: UNESCO, IMF, ILO, UNICEF, WHO.

Readings:

1. E. Laurd, A History of the United Nations, London, Macmillan, 1989.
2. W.H. Lewis (ed.), The Security Role of the United Nations, New York, Praegar, 1991.
3. P. Baehr and L. Gordenker, The United Nations in the 1990s, London, Oxford University Press, 1992.
4. K. P. Saxena, Reforming the United Nations : The Challenge and Relevance, New Delhi, Sage, 1993.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)

Semester-VI

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (i) : Comparative Constitutions of UK & USA

M. Marks : 80
Internal Assessment : 20
Time : 3 Hours

NOTE : Total 10 questions will be set: four each from Part A and Part B and the two from Part C. Candidates will have to attempt five questions in all selecting at least one question from each part. There will be one compulsory multiple choice objective type question.

UNIT-I

Evolution, Conventions, Legacies and Basic features of Constitutions of UK & USA; Socio-Economic basis of Constitutions of UK & USA.

UNIT-II

Comparative Study of Executive, Legislature

UNIT-III

Comparative study of Judiciary of U.K. & U.S.A.
Comparative studies of Structures, Functions and roles of political parties and pressure groups of UK & USA.

UNIT-IV

Electoral Processes, Voting Behaviour, Bureaucracy of UK & USA.

Readings

1. G. Almond et al., *Comparative Politics Today : A World View*, 7th edn., New York, London, Harper/Collins, 1000.
2. W. Bagehot, *The English Constitution*, London, Fontana, 1963.
3. J. Blondel, *An Introduction to Comparative Government*, London, Weidenfeld and Nicolson, 1969.
4. E.S. Griffith, *The American System of Government*, 6th edn., London, ethuen, 1983.
5. A.Lijphart,(ed.), *Parliamentary versus Presidential Government*, Oxford and New York, Oxford University Press, 1992.
6. M. Rhodes, P. Heywood and V. Wright, *Developments in West European Politics*, Basingstoke, Macmillan, 1997.
7. J. Wilson, *American Government*, 4th edn., Boston Massachusetts, Houghton Miffin, 1997.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

B.A. Part-III, Political Science (Pass Course)

Semester-VI

Note: The candidate will be required to attempt 5 questions in all. Question 1 consisting of (preferably eight) number of short answer type question (having no internal choice) spread over the whole syllabi should be compulsory. The candidate will be required to attempt 4 questions selecting at least one from each unit. All questions will carry equal marks.

Option (ii) : International Organization-II

Max. Marks : 80
Internal Assessment : 20
Time : 3 Hrs.

Note : Students are required to attempt five questions in all, selecting one question from each unit. Question No. 9 (Short Answers) will be from entire syllabus and is compulsory. This section will consist of nine short answer questions of 2 marks each.

Unit-I

Regional Organizations, European Community, SAARC, ASEAN

Unit-II

UN and Social Justice: Human Rights, Decolonization.

Unit-III

Working of the U.N. towards Peace : Peace Making, Peace, Enforcement, Peace building and Peace Keeping, An Assessment of U.N.

Unit: IV

UN and the Third World; Reforms and Democratization of U.N. System, India's claim for Permanent Membership of the Security Council.

Readings

1. Richard K. Ashley, "The Eye of Power : The Politics of World Modelling," International Organization, Vol. 37, No. 3, 1983.
2. E. Laurd, A History of the United Nations, London, Macmillan, 1989.
3. W.H. Lewis (ed.), The Security Role of the United Nations, New York, Praegar, 1991.
4. P. Baehr and L. Gordenker, The United Nations in the 1990s, London, Oxford University Press, 1992.
5. Rikhey, Strengthening UN Peace keeping, London, Hurst and Co., 1993.
6. K. P. Saxena, Reforming the United Nations : The Challenge and Relevance, New Delhi, Sage, 1993.

INDIRA GANDHI UNIVERSITY, MEERPUR - REWARI

(A State University Established under Haryana Act No. 29 of 2013)

Syllabus and Scheme of Examination of B. A. Pass Course English 1st to 6th Semesters

B. A. Part I
English (Compulsory)
Semester I
Literature and Language I

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text :

Mohan, Loveleen, Randeep Rana and Jaibir Singh Hooda eds. *Literature and Language I*, Delhi: Orient Blackswan, 2015 (Revised Edition).

Workload: 8 periods of 45 minutes per week for Text: 2 periods of 45 minutes per week for composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q 1 will be based on phonetic transcription given in the chapters in the text book. The students shall transcribe *eight* words out of the given *twelve*.

(08)

Q 2 will comprise very short answer type questions (using a word, a phrase or one or two sentences each) based on the chapters in the text book. The students shall answer any *eight* out of the given *twelve* items.

(08)

Q 3 will comprise inference based questions to elicit the understanding of the text by the students. The students shall answer any *five* out of the given *eight* questions based on the chapters (in about 75-100 words each).

(20)

Q 4 will be based on a comprehension passage from the text followed by *four* questions.

(04)

Q 5 will be based on vocabulary given in the exercises. The students shall attempt questions on vocabulary as directed. (e.g. framing sentences of their own or giving various forms of the given words-synonyms, antonyms, one word substitutes). The students shall answer any *eight* out of the given *twelve* words.

(08)

Q 6 will be based on grammar topics discussed in the text book. It will have two parts – (a) and (b). Part (a) will be based on the use of tenses and Part (b) on parts of speech. Both the parts will carry 12 marks each. There will be 50% internal choice in both the parts.

(24)

Note: Questions will be based on the exercises but not necessarily from the exercises as such.

In Q 7, students will be required to write a Paragraph in about 150 words on any *one* out of the given *three* topics. The topics will be similar to the topics given in the exercises in the text book.

(08)

B. A. Part I
English (Compulsory)
Semester II
Literature and Language II

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text :

Literature and Language I I eds. Jaibir S. Hooda, Randeep Rana and Loveleen Mohan.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1 (a)Transcription of one/two syllabic words only from the words given in the exercises given at the end of the chapters. Students will be required to transcribe any four out of the given eight words. 4 Marks

(b)Antonyms and synonyms from the exercises given at the end of the chapters. Students will be required to give four antonyms and four synonyms out of the given eight each. 4 Marks

Q.No.2 (a) Very short answer type questions. Students will be required to answer any four out of given eight questions in a word/phrase/sentence. The questions may not necessarily be the same as given in the exercises. 4 Marks

(b) Students will be required to attempt any six out of the given nine questions in 2 – 5 sentences/50 words each. Short answer type questions also may not be the same as given in the exercises. 12 Marks

Q.No. 3 Long answer type questions. Students will be required to attempt in about 150 – 200 words each any three out of the given six questions. 21 Marks

Q.No. 4 (a) Grammar: This question will be based on the grammar exercises given in the text. The sentences will not necessarily be the same as given in exercises. There will be 50% internal choice. 20 Marks

(b) One question based on Grammar topics covered in Semester I (with 50% internal choice) 7 Marks

Q.No.5 Composition: Students will be required to write an essay in about 200 words on one of the two given topics with hints for composition. 8 Marks

B.A. Part II
English (Compulsory)
Semester III (Session 2015-16)

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text:

Fragrances: edited by Dinesh Kumar, Sunita Siroha and S.S. Rehal, and published by Orient Blackswan, New Delhi.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1. Students will be required to explain any *two* stanzas out of the given *three* with reference to the context. (8 Marks)

Q.No.2. It will comprise very short answer type questions based on the poems in the text book. The students shall answer any *six* out of the given *eight* questions (in about 20 to 30 words each). (6 Marks)

Q.No.3. It will comprise inference based questions to elicit the understanding of the text by the students. The students shall answer any *two* out of the given *three* questions based on the poems (in about 150 to 200 words each). (12 Marks)

Q.No.4. It will be based on a comprehension passage from the text followed by *four* questions. (4 Marks)

Q.No.5. (a) This question will be based on the grammar topics discussed in the text book. The sentences will not necessarily be the same as given in the exercises. Students will be required to attempt any *sixteen* out of the given *twenty four*. (16 Marks)

(b) In this question the students will be required to attempt *two* out of the given *three* questions. The candidates may be asked to identify literary devices from the extracts from the prescribed poems. (6 Marks)

(c) In this question the students will be required to write short note on *two* out of the given *four* poetic forms based on the prescribed poems and discussed in the text book. (6 Marks)

(d) Transcription of any *six* words out of the given nine from the text (not more than trisyllabic words). (6 Marks)

(For visually challenged students only)
Students will be required to write a paragraph in about 100 words on any *one* out of the given *three* paragraphs of general nature.

(e) Vocabulary exercise. The student will attempt any *eight* out of the given *twelve* vocabulary based items (not necessarily the same as given in the exercises). (8 Marks)

Q.No.6 Composition: Students will be required to write an essay in about 200 words on any *one* of the *four* given topics of general nature. (8 Marks)

UGBOS dt 20.01.2016

Parveen Datta 20/1/2016

B.A. Part II
English (Compulsory)
Semester IV (Session 2015-16)

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 hrs

Prescribed Text:

Centre Stage edited by Sunita Siroha, S.S. Rehal and Dinesh Kumar and published by Orient Blackswan, New Delhi.

Workload: 8 periods of 45 minutes duration per week for Text. 2 periods of 45 minutes duration per week for Grammar and Composition for a group of 20 students.

Instructions to the Paper-setter and Students:

Note: All questions are compulsory.

Q.No.1. Explanation of one extract out of the given two with reference to the context. (8 Marks)

Q.No.2.(a) Very short answer type text-based questions: Students will be required to answer any six out of the given eight questions in a word/phrase/sentence. (6 Marks)

(b) Students will be required to attempt any two out of the given three questions based on the text in 100 words each. Short answer type questions also may not be the same as given in the exercises. (6+6 Marks)

Q.No.3. Long answer type question based on the text, to be answered in about 300 words on any one of the given two questions. The questions will be designed to test the candidate's critical understanding of the text. (12 Marks)

Q.No.4(a)**Writing Skills:** This question, with internal choice, will be based on the topics discussed in the text-book under the title "Extended Language Skills" except "Translation". (15 Marks)

(b) Students will be required to transcribe and mark primary stress on any ten words out of the given fifteen words. (10 Marks)

(For visually challenged candidates only) There will be a question based on vocabulary.

(c) Vocabulary exercise (any five out of the given eight). (5 Marks)

Q.No.5 **Translation:**

(a) Students will be required to translate one short passage from Hindi into English. (6 Marks)

(b) Students will be required to translate one short passage from English into Hindi. (6 Marks)

Or (In lieu of translation for Foreign students only)

Make a précis of a prose passage (300 words). (12 Marks)

UGBOS dt 20.01.2016

B. A. Part III
English (Compulsory)
Semester V
Session 2016-2017

Scheme of Examination

Total Marks: 100
Theory: 80
Int. Assessment: 20
Time: 3 Hours

Prescribed Text: To be got published by CDLU, Sirsa
Work Load: 8 Periods of 45 minutes duration per week for Text and 2 periods of 45 minutes duration per week for composition for a group of 20 students

Instructions to the Paper-Setter and Students

In Question 1, students will be required to answer any *four* out of the given *six* in about 100 words each from the prescribed text. 4x4 =16

Question 2 will be an essay type question (with internal choice) from the prescribed text. 14

In Question 3, students will be required to give answers to the questions that follow a passage from the prescribed text. 6

In Question 4, students will be required to write short notes on any *three* literary terms out of the given *five.* Students are also required to illustrate the term by citing from the prescribed text. 3x3 =9

Question 5 will be a 'Do as Directed' type question based on following items:

(A) Conversion of Sentences – from simple to compound and complex sentences. 6

(B) Conditional Clauses 6

(C) Defining and Non-Defining Clauses 6

[Standard Grammar books like *A Handbook of English Grammar* by R. W. Zandvoort and *A Comprehensive Grammar of English Language* by Randolph Quirk]

In Question 6, students will be required to develop a short story on the basis of the given outline/hints 5

In Question 7, students will be required to make a précis of a passage of about 300 words. 12

B.A.III English (Compulsory)

Semester VI Jan.2017

(w.e.f. Session 2016-17)

Title – *Interpreting A Play*: *The Merchant of Venice*

&

Developing Composition Skills

Edited by Deepti Dharmani, Pankaj Sharma and Umed Singh :

Macmillan Publishers India Pvt.Ltd.

A Compulsory textbook prescribed for BA 6th Semester

CDLU Sirsa, MDU Rohtak, KU Kurukshetra

Work Load : 8 periods of 45 minutes a week for Text

2 periods of 45 minutes a week for composition for a group of 20 students

Text: To be prepared and got published by CDLU, Sirsa

Scheme of Examination

Total Marks	:	100
Theory	:	80
Internal Assessment	:	20

Time 3 Hours

Instructions to the Paper Setter and the Students

Q.1 a) Explanation with reference to the context of a given passage (with internal choice) taken from the prescribed text. 8

b) Short answer type questions: Students will be required to give answers (in about 50 words) to five questions out of given eight questions based on the prescribed text: 3X5 = 15

Q.2 Students will be required to attempt one essay type question based on the prescribed text (with internal choice). 12

Head,
Dep... English
and ... gs.,
MNI... ersity,
ROHTAK.

Q.3 a) Students will be required to write a précis of an unseen prose passage of about 400 words. 10

b) Students will be required to attempt a summary/abstract of a given unseen passage of about 250 words. 10

c) Students will be required to attempt one word substitute of any five of the given eight: This question will be set from the prescribed text book. 5

Q.4 Letter Writing: Business & Official letters based on the text but not necessarily the same.

Students will be required to attempt one of the given two. 10

Q.5 Comprehension of an unseen passage 10

Head,
Department of English
and Foreign Lgs.,
M. D. University,
ROHTAK.

Indira Gandhi University, Meerpur- Rewari

(A State University Established under Haryana Act No. 29 of 2013)

DEPARTMENT OF GEOGRAPHY

Syllabi and Scheme of Examination of Geography in B.A (Pass Course)

w.e.f. the academic session 2020-21

PREFEACE

The papers of Geography are introduced in the Bachelor of Arts (B.A.) which is a three-year full time degree course consisting of six semesters. Eachsemester shall consist of one theory and one practical paper of geography. Each course of these semesters will carry 100 marks of which 15 marks will be for internal assessment and 60 marks for theory paper. The marks of practical paper are 25.

The syllabus of the papers (courses) has been divided into four units. There shall be nine questions in all. The first question would be compulsory, shall be short answer type. It would carry six short questions from the entire syllabus. The candidate will be required to attempt all questions. Each short answer type question would carry two marks (06×2=12 marks). There shall be two questions from each unit and the candidate shall be required to attempt one question from each unit. Each unit shall carry 12 marks (12×4= 48 Marks) The duration of the examination shall be three hours. The evaluation pattern for these examinations shall be as per the University regulations. The medium of instruction shall be both English and Hindi.

Note: The break–up of marks & pattern for Internal Assessment & attendance component shall be as per university rules.

Indira Gandhi University, Meerpur- Rewari

B.A. Geography (Pass Course)

with effect from the Academic Session 2020-21

B.A. FIRST YEAR - Semester-I w.e.f. 2020-21

Sr. No	Course Code	Nomenclature of the course	Theory	Internal Assessment	Practical/ Lab	Total
I	UG-GEO 101	Geography of India	60	15	-	75
II	UG-GEO 102	Maps and scales (Practical)	-	-	25	25
Semester-II						
III	UG-GEO 103	Physical Geography-I	60	15	-	75
IV	UG-GEO 104	Representation of Physical Features (Practical)	-	-	25	25
B.A. SECOND YEAR- Semester-III w.e.f. 2021-22						
V	UG-GEO 201	Physical Geography-II	60	15	-	75
VI	UG-GEO 202	Representation of Climatic Data and Survey (Practical)	-	-	25	25
Semester-IV						
VII	UG-GEO 203	Human Geography	60	15	-	75
VIII	UG-GEO 204	Maps projections and Survey (Practical)	-	-	25	25
B.A. THIRD YEAR- Semester-V w.e.f. 2022-23						
IX	UG-GEO 301	Economic Geography	60	15	-	75
X	UG-GEO 302	Distribution Maps, Diagrams and Survey (Practical)	-	-	25	25
Semester-VI						
XI	UG-GEO 303	Introduction to Remote Sensing, GIS and Quantitative Methods	60	15	-	75
XII	UG-GEO 304	Introduction to Remote Sensing and Field Survey Report (Practical)	-	-	25	25

B.A. GEOGRAPHY (PASS COURSE) - FIRST YEAR
(FIRST SEMESTER)

Learning Outcomes and Objectives

1. To familiarize the students with the physiography of India and Haryana.
2. To provide the students an acquaintance with the demographic component of India and Haryana.
3. The aim of this course is to introduce the students to the economy and various types of resources in India and Haryana.

B.A (GEOGRAPHY) – FIRST SEMESTER
GEOGRAPHY OF INDIA
UG – GEO 101

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question- 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I

1. India: locational setting; relief and drainage systems.
2. Climate of India, climatic regions, drainage system of India, soils, natural vegetation, natural hazards- drought and flood.

UNIT – II

3. Population: distribution, density and growth.
4. Literacy, age & sex composition and levels of urbanization, migration pattern in India

UNIT- III

5. Distribution and production of major crops; Rice, Wheat, Cotton and Tea; Irrigation, Green Revolution and problems of Indian Agriculture.
6. Industries- iron and steel, cotton textile, sugar and petrochemical industries and industrial regions of India.

UNIT-IV (HARYANA)

7. Introduction to physiography and soil degradation.
8. Demographic aspects – growth of population, literacy, sex ratio and urbanization.
9. Agriculture, Industry and Transport.

Suggested Readings

1. Deshpande D: India – A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2. Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.
3. Shafi, M: Geography of South Asia, McMillan and Company, Calcutta,2000.
4. Singh, R L (ed): India: A Regional Geography, National Geographical Society, India, Varanasi,1971.
5. Singh, Surender and Saroha, Jitender: Geography of India, Access Publishing India Pvt. Ltd., New Delhi,2014.
6. Spate, D H K and ATA Learmonth: Indian and Pakistan – Land, People and Economy, Methnen and Company, London,1967.
7. Tiwari, R.C. (2007) Geography of India, Prayag Pustak Bhawan, Allahabad.
8. Sharma, T.C. (2013) Economic Geography of India, Rawat Publication, Jaipur.

B.A (GEOGRAPHY) – FIRST SEMESTER
MAPS AND SCALES (PRACTICAL)
UG- GEO 102

Distribution of Marks **Maximum Marks: 25**
Exercises=15 **Time: 3 Hour**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

1.	Introduction to Cartography	
2.	Maps and their types	
3.	Map Scales	Exercises
a.	Methods of Expressing a scale	2
b.	Conversion of Statement of Scale into R.F. and vice –versa.	1
c.	Plain Scale (Km and mile)	2
d.	Comparative Scale	4
e.	Diagonal Scale	1
4.	Measurement of Distances and Areas on Maps	2
5.	Enlargement and Reduction of Maps	2

Suggested Readings

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.I. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004) 4 th edition, Map Work and Practical Geography, Viksa Publication House.

B.A. GEOGRAPHY (PASS COURSE) - SECOND SEMESTER

Learning Outcomes and Objectives:

1. To enable students understand the processes of endogenetic and exogenetic movements of the earth.
2. To introduce the students to the concept of cycle of erosion and various agents of gradation shaping the earth.

B.A. GEOGRAPHY - SECOND SEMESTER
PHYSICAL GEOGRAPHY-I
UG - GEO 103

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature and scope of Physical Geography.
2. Interior structure of the earth, geological time scale and rocks.

UNIT- II

3. Earth movements; orogenic and epeirogenic, earthquake and volcanoes.
4. Theory of Isostasy, Wegner's theory of continental drift and Plate tectonic theory.

UNIT- III

5. Weathering: causes and its types.
6. Mass-movements: causes, types and impacts.

UNIT- IV

7. Concept of cycle of erosion; cycle of erosion by W.M. Davis
8. Processes and land forms of Wind, River, Underground water, Glacier and Sea waves.

Suggested Readings

1. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
2. Singh Savinder, Geomorphology, Prayag Publication, Allahabad1998.
3. Singh Savinder, Physical Geography Prayag Publication, Allahabad,1998.
4. Sparks B.W. Geomorphology, Jojngman, London,1960.
5. Thornbury W.D. 1969 Principles of Geomorphology, New York, John Wiley &Sons.
6. Gautam, A (2010): Bhautik Bhugol, Rastogi Publications, Meerut.
7. Tikkaa, R.N. (1989): Bhautik Bhugol ka Swaroop, Kedarnath Ram Nath, Meerut.
8. Singh, S (2009) Bhautik Bhugol ka Swaroop, Prayag Pustak, Allahabad.

B.A. GEOGRAPHY - SECOND SEMESTER

REPRESENTATION OF PHYSICAL FEATURES (PRACTICAL)

UG - GEO 104

Distribution of Marks **Maximum Marks: 25**
Exercises=15 **Time: 3 Hour**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

		Exercises
1.	Introduction to Topographical Sheets India and adjacent countries a. Degree Sheet b. Half Degree Sheet c. Quarter Degree Sheet d. Series of Scale e. Conventional Signs	5
2.	Methods of representing relief	1
3.	Representation of Topographical features by contours. Slopes (Concave, convex, undulating and terraced) Valleys (V Shaped, U shaped, Gorge, Re-entrant) Ridges (Conical hill, Volcanic hill, Plateau, Escarpment) Complex features (waterfall, sea cliff, overhanging cliff, Fiord coast)	4
4.	Drawing of Profiles a. Cross Profiles: Serial, superimposed, projected and composite profiles. b. Longitudinal Profiles	5

Suggested Readings

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Mothuen and Co. Ltd., London.
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.I. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad
4. Singh Gopal (2004) 4th edition, Map Work and Practical Geography, Vikas Publication House, New Delhi.

B.A. GEOGRAPHY (PASS COURSE) SECOND YEAR (THIRD SEMESTER)

Learning Outcomes and Objectives:

1. To enable students to understand the atmospheric and hydrospheric components of the earth system;
2. To familiarize the students with the processes and dynamics of Oceanic circulation.

B.A. GEOGRAPHY (THIRD SEMESTER)
PHYSICAL GEOGRAPHY-II
UG – GEO 201

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT-I

1. Weather and climate; origin, composition and structure of atmosphere.
2. Insolation, global heat budget, horizontal and vertical distribution of temperature, inversion of temperature.

UNIT-II

3. Atmospheric pressure: measurement and distribution, pressure belts, planetary, seasonal and local winds.
4. Humidity: measurement and variables; evaporation and condensation, precipitation: forms, types and distribution; hydrological cycle.

UNIT-III

5. Air masses: concept and classification; fronts: type and characteristics.
6. Weather disturbances: tropical and extra-tropical cyclones.

UNIT-IV

7. Configuration of oceanic floor and bottom relief of Pacific and Atlantic oceans; temperature of oceans.
8. Oceanic currents; circulation in Pacific, Atlantic and Indian Oceans; Oceanic resources.

Suggested Readings

1. Barry, RG and Chorley R.J., Atmosphere, Weather and Climate, Routledge,1998.
2. Critchfield, H., General Climatology, Prentice-Hall of India,2002.
3. King, C. Oceanography for Geographers, Edward Arnold, London,1975.
4. Trewartha, GT: An Introduction to Climate, Mc-Graw Hill, New York,1981.
5. Trewartha, G.T., The Earth's Problems Climates, University of Wisconsin Press, USA.
6. Gupta L S (2000): Jalvayu Vigyan, Hindi Madhyam Karyanvay Nidishalya, DelhiVishwa Vidhyalaya, Delhi.
7. Lal, D S (2006): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.
8. Vatal, M (1986): Bhautik Bhugol, Central Book Depot, Allahabad.
9. Singh, S (2009): Jalvayu Vigyan, Prayag Pustak Bhawan, Allahabad.

B.A. GEOGRAPHY (THIRD SEMESTER)
REPRESENTATION OF CLIMATIC DATA AND SURVEY (PRACTICAL)
UG - GEO 202

Distribution of Marks:
Exercises=15
Record File=05
Viva-voce=05

Maximum Marks: 25
Time: 3 Hour

Note: There will be four questions in all and candidate has to attempt three exercises.

1. Measurement of temperature, rainfall, pressure and humidity.
2. Representation of temperature and rainfall.
   a. Combined Line and Bar Graph — Exercise 1
   b. Distribution of temperature (Isotherms) — Exercise 1
   c. Distribution of rainfall (Isohytes) — Exercise 1
   d. Hythergraph — Exercise 1
   e. Rainfall deviation diagram — Exercise 1
3. Climograph (wet and dry places) - — Exercise 2
4. Distribution of pressure (Isobars) - — Exercise 2
5. Weather map interpretation (January &July) - — Exercise 2
6. Chain and tape survey — Exercise 2

Suggested Readings

1. Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse, FJ, and Wilkinson H.R., 1972. Maps and Diagrams, Methuen Press, London
3. Robinson, A.H. et.al. Elements of Cartography, John Wiley &Sons,1995.
4. Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.

B.A. GEOGRAPHY (PASS COURSE) FOURTH SEMESTER

Learning Outcomes and Objectives:

1. To make the students familiar with the men- environment relation and human adaptation to the environment.
2. The students will have the ability to understand the growth, distribution and composition of population in different parts of the world;
3. Analyze the types and patterns of rural settlements in India and other regions of the world.

B.A. GEOGRAPHY (FOURTH SEMESTER)
HUMAN GEOGRAPHY
UG – GEO 203

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question- 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT -I

1. Nature and scope of human geography; branches of human geography; approaches to the study of human geography.
2. Division of mankind: spatial distribution of tribes of India: Santhals, Gonds and Bhils.

UNIT - II

3. Concept of man- environment relation: A historical approach.
4. Human adaptation to the environment (i) cold region Eskimos (ii) Hot Region – Bushman.

UNIT - III

5. Distribution, density and growth of world population.
6. Population theories: Malthus and optimum population theory.

UNIT-IV

7. Rural settlements: meaning, classification and types.
8. Population pressure, resource use and environment degradation; concept of deforestation, air and water pollution.

Suggested Readings

1. Aggarwal, A: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi,1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice- Hall, New Jersey,1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London,1987.
5. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi,1986.
6. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
7. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA,1997.
8. Global Environment Outlook: Earthscan, London,2000.
9. McBride, P.J. Human Geography; Systems Patterns and Change, Nelson, UK and Canada,1996.
10. Michael, Can: New Patterns: Process and Change in Human Geography, Nelson,1996.
11. Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.
12. Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan, Allahabad.
13. Hussin, Majid (2012) Manac Bhugol, Rawat Publications, Jaipur.

B.A. GEOGRAPHY (FOURTH SEMESTER)
MAP PROJECTIONS AND SURVEY (PRACTICAL)
UG - GEO 204

Distribution of Marks: **Maximum Marks: 25**
Exercises=15 **Maximum Time: 3 Hours**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

Total Exercises = 15

1. Introduction to Map Projection: Meaning, Classification and importance; Characteristics of lines of latitudes and longitudes.
2. Cylindrical projections: Characteristics, applications and drawing; (3)
   a. Simple cylindrical projection
   b. Cylindrical equal area projection
   c. True shape or orthomorphic or Mercator's Projection (5)
3. Conical Projections: Characteristics, applications and drawing
   a. Simple conical projections with one standard parallel
   b. Simple conical projection with two standard parallel
   c. Bonne's Projection
   d. Polyconic projection
   e. International Map Projection

4. Zenithal Projections: Characteristics, applications and drawing. (5)
   a. Polar Zenithal Equidistant Projection.
   b. Polar Zenithal Equal Area Projection
   c. Polar Zenithal Gnomonic Projection
   d. Polar Zenithal Stereographic Projection.
   e. Polar Zenithal Orthographic Projection

5. Characteristics, drawing and applications of
   a. Sinusoidal and (2)
   b. Mollweide Projections
6. Plane Table Survey (2)

Suggested Readings

1. Goyal K.K.1981. Practical Geography, Manthan Publication, Rohtak.
2. GregoryS. 1963.Statistical Methodsand the Geography,Longman,London.
3. Khan, A.A. 1996. Text Book of Practical Geography, Concept, NewDelhi,.
4. Lawarence, GRP1968. Cartographic Methods, Methuen, London,
5. Monkhouse, F.J. and Wilkinson, H.R1994. Maps and Diagrams, Methuen, London,
6. Pal. S.K. 1998: Statistics for Geoscientist- Techniques and Applications, Concept Publication, New Delhi,.
7. Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta,
8. Singh,R.L.1972. Elements of Practical Geography,Kalyani Pub.,New Delhi
9. Steers, J.B. Map Projections; University of London Press, London.

B.A. GEOGRAPHY (PASS COURSE) THIRD YEAR
(FIFTH SEMESTER)

Learning Outcomes and Objectives:

1. To introduce students to classification of economic activities and their impact on environment.
2. To impart knowledge about natural resources and importance of their utilization.
3. To acquaint students with understanding of the spatial distribution of crops, mineral resources and industries in the world.

B.A. GEOGRAPHY - FIFTH SEMESTER
ECONOMIC GEOGRAPHY
UG – GEO 301

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question -1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature, scope of economic geography; it's relation with economics and other branches of social sciences.
2. Classification of economic activities and their impact on environment.

UNIT- II

3. World natural resources: types, bases and classification.
4. Conservation and utilization of natural resources.

UNIT- III

5. Spatial distribution of food (rice and wheat), commercial (cotton and sugarcane) and plantation crops (tea, rubber and coffee).
6. Classification of mineral resources (ferrous and non-ferrous); distribution and production of coal, iron ore, petroleum and natural gas.

UNIT- IV

7. Classification of industries; world distribution and production of iron and steel and textile industry, major industrial complexes of the world.
8. Transport, communication and trade: geographical factors in their development; major modes of water, land and air transport; recent trends in international trade

Suggested Readings

1. Hartshorne T Nand Alexander JW. 1988. Economic Geography, Prentice Hall, New Delhi.
2. Jones CF and Darkenwald GG. 1975. Economic Geography. McMillan Company, New York
3. Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, NewYork.
4. Wheeler J et al. 1995. Economic Geography. John Wiley,New York.

B.A. GEOGRAPHY - FIFTH SEMESTER
DISTRIBUTION OF MAPS, DIAGRAMS AND SURVEY (PRACTICAL)
UG – GEO 302

Distribution of Marks: **Maximum Marks: 25**
Exercises=15 **Time: 3 Hour**
Record File=05
Viva-voce=05

Note: There will be four questions in all and candidate has to attempt three exercises.

1. Principal of map design and layout
2. Symbolization: point, line and area symbol
3. Lettering and toponomy
4. Mechanics of map construction
5. Distribution maps

(i) Qualitative distribution maps

- Choroschematic maps- 1 Exercise
- Chorochromatic maps- 2 Exercise

(ii) Quantitative distribution Maps

- Isopleth maps-3 exercise
- Choropleth maps- 3 exercise
- Dot Maps- 3 exercise
- Diagrammatic Maps- 3 exercise

6. Prismatic Compass Survey – 2 Exercises.

Suggested readings

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

B.A. GEOGRAPHY (PASS COURSE) SIXTH SEMESTER

Learning Outcomes and Objectives:

1. To provide knowledge of aerial photographs and their interpretation.
2. To familiarize students with the basics of Remote Sensing &GIS and their application.
3. To make the students familiar with basic statistical methods in geography.

B.A. GEOGRAPHY - SIXTH SEMESTER
INTRODUCTION TO REMOTE SENSING, GIS & QUANTITATIVE METHODS
UG – GEO 303

Maximum Marks: 75
External Assessment Marks: 60
Internal Assessment Marks: 15
Time: 3 Hours

Note: There shall be nine questions in all. The candidates have to attempt five questions including Question 1 which is compulsory comprising six short questions to be answered in 15-20 words each. In addition, the candidates have to attempt four more questions selecting at least one from each unit. All questions carry equal marks.

Unit-I

1. Introduction to aerial photographs: their types and advantages.
2. Elements of aerial photo interpretation.

Unit-II

3. Introduction to Remote Sensing; electromagnetic spectrum, stages in remote sensing, type of remote sensing, satellite orbits- geostationary and near polar.
4. Application of remote sensing in various fields such as agriculture, environment and resource mapping.

Unit-III

5. Introduction to Geographical Information System: definition, purpose, components and functions.
6. Application of GIS in various fields of geography.

Unit-IV

7. Measures of Central Tendency: Mean, Median and Mode.
8. Measure of Dispersion: Range, Quartile deviation and Mean deviation, Standard deviation, Coefficient of variation.

Suggested Readings

1. Aslam Mahmood 1993. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi,
2. John R. Jensen 2009. Remote Sensing of the Environment; An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi,
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi,
4. Lillesand and R.W. Kiefer,2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi,

B.A. GEOGRAPHY - SIXTH SEMESTER

INTRODUCTION TO REMOTE SENSING, GPS AND FIELD SURVEY REPORT (PRACTICAL)

UG – GEO 304

Maximum Marks: 25

Time: 3 Hours

A. Remote Sensing Practical – 15 Marks

Marks Breakup:
Exercise = 09
Record book: 03
Viva-voce: 03

1. Demarcation of Principal Point, Conjugate Principal point and Flight line on Aerial Photographs - 3 exercise
2. Use of Stereoscope and Identification of Features- 2 exercise.
3. Identification of Features from satellite images- 2 exercises.
4. Mapping by GIS -2 exercises.

B. Socio-economic Survey and Report Writing -10 marks.

Marks Break up
Field Survey Report = 06 marks
Viva voce= 04 marks

Suggested Readings

1. John R. Jensen, Remote Sensing of the Environment; An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi,2009.
2. Lillesand and R.W.Kiefer, Remote Sensing and Image Interpretation, John Wiley and Sons,1994.
3. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
4. Chauniyal, D.D. (2010) Sudur Samvedan evam Bhogolik Suchana Pranali,Sharda Pustak Bhawan, Allahabad.