GENERAL HINDI

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

इकाई - I पद्य

(i) मैथिलीशरणगुप्त: भारतकीश्रेष्ठता

(ii) सुमित्रानन्दनपंत: वापू,प्रथमरश्मि

(iii) सूर्य कान्तत्रिपाठीनिराला: जागोफिरएकवार,तोड़तीपत्थर

(iv) रामधारीसिंहदिनकर: हिमालय,वुद्धदेव(वोधिसत्व)

इकाई- II गद्य

(i) वालमुकुन्दगुप्त: एकदुराशा

(ii) हजारीप्रसादद्विवेदी: शिरीषकेफूल

(iii) कुवेरनाथराय: हरीहरीदूवऔरलाचारकोध

(iv) हरीशंकरपरसाई: इंस्पेक्टरमातादीनचांदपर

इकाई- III शब्दसंपदा

(i) विलोम(ii) पर्यायवाची(iii) अनेकार्थक (iv) वाक्यांशकेलियेएकशव्द(v) मुहावरेऔरलोकोक्ति

इकाई- IV शुद्धिकरणएवंप्रयोग

(i) शव्दऔरवाक्यशुद्धि

(ii) शव्दएवंवाक्यप्रयोग

इकाई- V शब्दनिर्माण

(i) उपसर्ग

(ii) प्रत्यय

GENERAL ENGLISH

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

Objectives:

- Reinforcing selected components of grammer and usages.
- Facilitating comprehension of a prosepassage.
- To introducethe students to proper usage of dictionary and thesaurus.

Unit – I(Vocabulary)

- How to use a dictionary and thesaurus.
- Word formation: Prefix and suffix.

Unit – II(Grammer and Usage – I)

Transformation of sentences.

- Direct and indirect narration.
- Active and passive Voice.
- Interchange of Degrees of Comparison.

Unit – III(Grammer and Usage – II)

- Sequence of Tenses.
- Prepositions.

Unit – IV(Grammer and Usage – III)

- Modal Auxiliaries.
- Articles.

Unit – V(Comprehension)

- Comprehension of an unseen passage.

Suggested Reading:

1. A University Grammer of English by Quirk and Greenbaum.
2. A Foundation English Course for Undergraduates. Ed. Gunashekhar
3. Prose for Pleasure and Comprehension by H G Suryanarayan Rao.
4. A Guide to Patterns andUsage by AS Hornby.

ENVIRONMENTAL STUDIES

Scheme of examination: *MM:* 70

1. The Question paper shall be of ***TWO HOURS*** duration.
2. **Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)**
3. **Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. Candidate has to attempt any five. Each question shall carry Four marks. (5 X 4 = 20 marks).**
4. **Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. Candidate has to attempt any two. Each question shall carry Fifteen marks. (2 X 15 = 30 marks).**

UNIT – I

The multidisciplinary nature of environmental studies.

Definition, Scope and importance, Need for public awareness.

Unit – II

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 forest and tribal people.**
- **Water Resources: Use and over exploitation of surface and ground water, Floods, draught, conflicts over water, dams- benefits and problems.**
- **Mineral Resources: Use and exploitation, 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 need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT-III

Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Producers, consumers and decomposers.
- Energy flow in ecosystems.
- 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, estuaries).

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

B.Sc/B.Sc (Hons.) Semester I ECA P C S - 104

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. **Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)**
3. **Q. No. 2 shall contain 8 (Eight)Short-Answer-Type-Questions. Word limit for each question is 100 words. Candidate has to attempt any five. Each question shall carry Four marks. (5 X 4 = 20 marks).**
4. **Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. Candidate has to attempt any two. Each question shall carry Fifteen marks. (2 X 15 = 30 marks).**

UNIT – I

Introduction to computers and related terminology:

(Basic information only)

(A) Hardware: CPU (Mother board, Microprocessors, (The Intel Pentium III, AMD and Cyrix), MMX technology, System clock, Address Bus, Date Bus, (PCI and ESIC) Cache Memory, Processing speed, Expansion slots (Video controller, sound Card, SCSI, Network Card), Memory – (Unit, RAM, ROM, EDO, RAM, SI, RAM), Input and Output devices-Keyboard (The standard Keyboard layout), Mouse, Printers (Dot matrix, Inkjet, Laser Jet), Microphone, Speakers, Digital Cameras), Storagedevices – (Diskette Drive (Types, Density, Formatting Boot Record, FAT, Folder, Directory), Hard Disk Drive, CD ROM DRIVE, (CD ROM Speeds), CD-R Drive, DVD ROM Drive, Tape Drive.

(B) Software: Introduction to programming languages, System software (Operating Systems and Utilities), Application software (Word Processors, Spreadsheets, DBMS, Presentation Graphics, Browsers, Personal Information Managers) Introduction to Multilingual Word-Processors.

(C) Communications and Connectivity: Data Communication System, Data Transmission (Serial, Parallel, Bandwidth, Protocols), Emails, FAX, Voice and video massaging, Video

Conferencing, Online service user connection (Types), Networking of Computers, (Node, Client, Server, LAN, WAN), Using the Network, the internet and the Web.

UNIT – II

The Internet and Online Resources:

(Working Knowledge at Common Users Level only)

How the internet works, Introduction to (TCP/IP, and DNS Addresses. Features of the internet – (Email, News, Telnet, Chat, Channels, WWW, OnlineServices, Bulletin Board Services), Connection wizard, Overview of the internet explorer 5 and features therein, use of search engines, Surfing, creating and use of email, Awareness about e-commerce and its advantages.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

GENERAL HINDI

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

इकाई - I पद्य

(i) मैथिलीशरणगुप्त: भारतकीश्रेष्ठता

(ii) सुमित्रानन्दनपंत: वापू,प्रथमरश्मि

(iii) सूर्य कान्तत्रिपाठीनिराला: जागोफिरएकवार,तोड़तीपत्थर

(iv) रामधारीसिंहदिनकर: हिमालय,वुद्धदेव(वोधिसत्व)

इकाई- II गद्य

(i) वालमुकुन्दगुप्त: एकदुराशा

(ii) हजारीप्रसादद्विवेदी: शिरीषकेफूल

(iii) कुवेरनाथराय: हरीहरीदूवऔरलाचारकोध

(iv) हरीशंकरपरसाई: इंस्पेक्टरमातादीनचांदपर

इकाई- III शब्दसंपदा

(i) विलोम(ii) पर्यायवाची(iii) अनेकार्थक (iv) वाक्यांशकेलियेएकशव्द(v) मुहावरेऔरलोकोक्ति

इकाई- IV शुद्धिकरणएवंप्रयोग

(i) शव्दऔरवाक्यशुद्धि

(ii) शव्दएवंवाक्यप्रयोग

इकाई- V शब्दनिर्माण

(i) उपसर्ग

(ii) प्रत्यय

B.Com Semester I GE P C C - 102

GENERAL ENGLISH

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

Objectives:

- Reinforcing selected components of grammer and usages.
- Facilitating comprehension of a prosepassage.
- To introducethe students to proper usage of dictionary and thesaurus.

Unit – I(Vocabulary)

- How to use a dictionary and thesaurus.
- Word formation: Prefix and suffix.

Unit – II(Grammer and Usage – I)

Transformation of sentences.

- Direct and indirect narration.
- Active and passive Voice.
- Interchange of Degrees of Comparison.

Unit – III(Grammer and Usage – II)

- Sequence of Tenses.
- Prepositions.

Unit – IV(Grammer and Usage – III)

- Modal Auxiliaries.
- Articles.

Unit – V(Comprehension)

- Comprehension of an unseen passage.

Suggested Reading:

1. A University Grammer of English by Quirk and Greenbaum.
2. A Foundation English Course for Undergraduates. Ed. Gunashekhar
3. Prose for Pleasure and Comprehension by H G Suryanarayan Rao.
4. A Guide to Patterns and Usage by AS Hornby.

B Com Semester I ENVS P C C - 103

ENVIRONMENTAL STUDIES

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)
3. Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. **Candidate has to attempt any five**. Each question shall carry **Four** marks. (5 X 4 = 20 marks).
4. Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. **Candidate has to attempt any two**. Each question shall carry **Fifteen** marks. (2 X 15 = 30 marks).

UNIT – I

The multidisciplinary nature of environmental studies.

Definition, Scope and importance, Need for public awareness.

Unit – II

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 forest and tribal people.
- Water Resources: Use and over exploitation of surface and ground water, Floods, draught, conflicts over water, dams- benefits and problems.
- Mineral Resources: Use and exploitation, 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 need, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

- Land Resources: Land as a resource, land degradation, man included landslides, soil erosion and desertification.
- **Role of an individual in conservation of natural resources.**
- Equitable use of resources for sustainable lifestyles.

UNIT-III

Ecosystems

- **Concept of an ecosystem.**
- **Structure and function of an ecosystem.**
- **Producers, consumers and decomposers.**
- **Energy flow in ecosystems.**
- **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, estuaries).**

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)
3. Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. **Candidate has to attempt any five.** Each question shall carry **Four** marks. (5 X 4 = 20 marks).
4. Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. **Candidate has to attempt any two.** Each question shall carry **Fifteen** marks. (2 X 15 = 30 marks).

UNIT – I

Introduction to computers and related terminology:

(Basic information only)

(A) Hardware: CPU (Mother board, Microprocessors, (The Intel Pentium III, AMD and Cyrix), MMX technology, System clock, Address Bus, Date Bus, (PCI and ESIC) Cache Memory, Processing speed, Expansion slots (Video controller, sound Card, SCSI, Network Card), Memory – (Unit, RAM, ROM, EDO, RAM, SI, RAM), Input and Output devices- Keyboard (The standard Keyboard layout), Mouse, Printers (Dot matrix, Inkjet, Laser Jet), Microphone, Speakers, Digital Cameras), Storage devices – (Diskette Drive (Types, Density, Formatting Boot Record, FAT, Folder, Directory), Hard Disk Drive, CD ROM DRIVE, (CD ROM Speeds), CD-R Drive, DVD ROM Drive, Tape Drive.

(B) Software: Introduction to programming languages, System software (Operating Systems and Utilities), Application software (Word Processors, Spreadsheets, DBMS, Presentation

Graphics, Browsers, Personal Information Managers) Introduction to Multilingual Word-Processors.

(C) Communications and Connectivity: Data Communication System, Data Transmission (Serial, Parallel, Bandwidth, Protocols), Emails, FAX, Voice and video massaging, Video Conferencing, Online service user connection (Types), Networking of Computers, (Node, Client, Server, LAN, WAN), Using the Network, the internet and the Web.

UNIT – II

The Internet and Online Resources:

(Working Knowledge at Common Users Level only)

How the internet works, Introduction to (TCP/IP, and DNS Addresses. Features of the internet – (Email, News, Telnet, Chat, Channels, WWW, Online Services, Bulletin Board Services), Connection wizard, Overview of the internet explorer 5 and features therein, use of search engines, Surfing, creating and use of email, Awareness about e-commerce and its advantages.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

GENERAL HINDI

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

इकाई - I पद्य

(i) हरिवंशरायवच्चन: पथकीपहचानलहरोंकानिमंत्रण

(ii) केदारनाथअग्रवाल: मैंने उसकोदेखा यह धरतीहै उसकिसानकी

(iii) सुभद्राकुमारीचौहान: झांसीकीरानीप्रभुतुमभेरेमनकीजानो

(iv) नागार्जुन: कालिदासकेप्रतिप्रेतकेवयान

इकाई - II गद्य

(i) अमृतलालवेगड़: महाराजपुरसेग्वारीघाट

(ii) विजयदानदेथा: उजालेकेमुसाहिव

(iii) महादेवीवर्मा: सिस्तरकावास्ते

(iv) कन्हैयालालमिश्रप्रभाकर: मैंऔरमैं

इकाई - III

(i) संक्षेपण (ii) पल्लवन (iii) प्रारुप

इकाई - IV

प्रयोजनमूलकहिन्दीकेमुख्यतत्व

(i) पारिभाषिकशब्दावली:वर्गीकरणएवंप्रयोग

इकाई - V

निवन्धकिसीसामान्यविषयपरलगभग 500 शब्दोंकानिवन्ध

B.Sc/B.Sc (Hons.) Semester II GE P C S - 202

GENERAL ENGLISH

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

Objectives:

- **Introducing students to Phonetics, correct their pronunciation and word stress.**
- **Strengthening compositional skills.**
- **Introducing students to writing of notices, advertisements and poster making skills.**

Unit – I(Phonetics) **10 Marks**

- Transcription of Phonetic symbols.
- Wordstress.

Unit – II(Writing Skills) **20 Marks**

- CV"s and Job Applications.
- Precis Writing.

Unit – III(Compositional Skills) **20 Marks**

- Letter Writing (Formal and informal)
- Paragraph Writing.

Unit – IV(Writing Skills) **10 Marks**

- Notice Writing.

Unit – V(Use of Imagining Faculty) **10 Marks**

- Writing Advertisements.
- Poster Making.

Suggested Reading:

1. CVs and Job Applications by Judith Leigh.
2. English at workplace. Eds: Panja, Sawhney&Verma.
3. Professional Communication by R P Singh.
4. English made simple by Arthur Waldhorn and Arthur Zeiger.
5. The Written Word by Vandana R Singh.
6. Technical Writing by Sunder Rajan.

ENVIRONMENTAL STUDIES

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. **Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)**
3. **Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. Candidate has to attempt any five. Each question shall carry Four marks. (5 X 4 = 20 marks).**
4. **Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. Candidate has to attempt any two. Each question shall carry Fifteen marks. (2 X 15 = 30 marks).**

UNIT – I

Biodiversity and its conservation.

- Introduction – Definition: genetic, species and ecosystem diversity.
- Bio geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, asthetic and option values.
- Biodiversity at global, national and local levels.
- India as a mega diversity region.
- Hot spots of biodiversity.
- Threats to biodiversity – habitat loss, poaching of wild life, man – wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: *in situ* and *ex situ* conservation of biodiversity.

Unit – II

Environmental Pollutions:

1. Definition, causes, effects and control measures of

- Air Pollution,
- Water Pollution,

- Soil Pollution,
- Marine Pollution,
- Noise Pollution,
- Thermal Pollution,
- Nuclear Pollution,

2. Solid waste management: Causes, effects and control measures of urban and industrial waste.
3. Disaster management: Floods, earthquakes, cyclone and landslides.

UNIT-III

Social issues and the Environment:

- From unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation 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.
- Environmental protection laws in India.
- Population growth, variation among nations.
- Population explosion – family welfare programmes.
- Environment and Human Health.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)
3. Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. **Candidate has to attempt any five.** Each question shall carry Four marks. (5 X 4 = 20 marks).
4. Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. **Candidate has to attempt any two.** Each question shall carry Fifteen marks. (2 X 15 = 30 marks).

UNIT I

OPERATING SYSTEMS(Working knowledgeat common users level only):

OVERVIEW OF IMPORTANT dos COMMANDS, Windows 98: Installation, Scandisk, Control Panel, Taskbar, Toolbars, Display settings (Background, wallpapers, screensavers, Desktop themes),Files and Folder management, WindowsExplorer, Finding Files and Folders Formatting Disks and copying files, Printer settings, Modem installation, mouse installation, Adding and removing programmes, Active desktop Concepts,Winzip and its\application, Norton antivirus and its use, Use of calculator, Paintbrush, win amp, MPEG player and windows help.

UNIT II

Application Software (Working knowledge at common users level only):

(a) Word processing software – MS Word

Entering, editing and formatting text, Document formats (Page size and Orientation, Headers and Footers, Columns and Sections, Page layout), Spelling and grammer checks, Thesaurus, Find and replace, cut and Paste, Table and Formatting tables, Mail Merge, Styles and Templates.

(b) Spreadsheet Programme – MS Excel

Entering data, Lables, Values, Dates, formulas, Cell references, formats, Functions, Templates, charts and Maps, analysing datain a spreadsheet.

(c) DBMS – Microsoft Access

Database, Entering data into thedatabase, Creating databasetables, editingdata,viewing records, sorting records, queryinga database, generating reports.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

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(xv).....

(xvi).....

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(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

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(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

GENERAL HINDI

The Question paper shall be of *TWO HOURS* duration.

MM: 70

इकाई - I पद्य

(i) हरिवंशरायवच्चन: पथकीपहचानलहरोंकानिमंत्रण

(ii) केदारनाथअग्रवाल: मैंने उसकोदेखा यह धरतीहै उसकिसानकी

(iii) सुभद्राकुमारीचौहान: झांसीकीरानीप्रभुतुममेरेमनकीजानो

(iv) नागार्जुन: कालिदासकेप्रतिप्रेतकेवयान

इकाई - II गद्य

(i) अमृतलालवेगड: महाराजपुरसेग्वारीघाट

(ii) विजयदानदेथा: उजालेकेमुसाहिव

(iii) महादेवीवर्मा: सिस्तरकावास्ते

(iv) कन्हैयालालमिश्रप्रभाकर: मैंऔरमैं

इकाई - III

(i) संक्षेपण (ii) पल्लवन (iii) प्रारुप

इकाई - IV

प्रयोजनमूलकहिन्दीकेमुख्यतत्व

(i) पारिभाषिकशब्दावली:वर्गीकरणएवंप्रयोग

इकाई - V

निवन्धकिसीसामान्यविषयपरलगभग 500 शब्दोंकानिवन्ध

B.Com Semester II GE P C C - 202

GENERAL ENGLISH

The Question paper shall be of ***TWO HOURS*** duration.

MM: 70

Objectives:

- Introducing students to Phonetics, correct their pronunciation and word stress.
- Strengthening compositional skills.
- Introducing students to writing of notices, advertisements and poster making skills.

Unit – I(Phonetics) **10 Marks**

- Transcription of Phonetic symbols.
- Wordstress.

Unit – II(Writing Skills) **20 Marks**

- CV"s and Job Applications.
- Precis Writing.

Unit – III(Compositional Skills) **20 Marks**

- Letter Writing (Formal and informal)
- Paragraph Writing.

Unit – IV(Writing Skills) **10 Marks**

- Notice Writing.

Unit – V(Use of Imagining Faculty) **10 Marks**

- Writing Advertisements.
- Poster Making.

Suggested Reading:

1. CVs and Job Applications by Judith Leigh.
2. English at workplace. Eds: Panja, Sawhney&Verma.
3. Professional Communication by R P Singh.
4. English made simple by Arthur Waldhorn and Arthur Zeiger.
5. The Written Word by Vandana R Singh.
6. Technical Writing by Sunder Rajan.

B Com Semester II ENVS P C C - 203

ENVIRONMENTAL STUDIES

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. **Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)**
3. **Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. Candidate has to attempt any five. Each question shall carry Four marks. (5 X 4 = 20 marks).**
4. **Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. Candidate has to attempt any two. Each question shall carry Fifteen marks. (2 X 15 = 30 marks).**

UNIT – I

Biodiversity and its conservation.

- Introduction – Definition: genetic, species and ecosystem diversity.
- Bio geographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, asthetic and option values.
- Biodiversity at global, national and local levels.
- India as a mega diversity region.
- Hot spots of biodiversity.
- Threats to biodiversity – habitat loss, poaching of wild life, man – wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity: *in situ* and *ex situ* conservation of biodiversity.

Unit – II

Environmental Pollutions:

1. Definition, causes, effects and control measures of
- Air Pollution,
- Water Pollution,

- Soil Pollution,
- Marine Pollution,
- Noise Pollution,
- Thermal Pollution,
- Nuclear Pollution,

2. Solid waste management: Causes, effects and control measures of urban and industrial waste.
3. Disaster management: Floods, earthquakes, cyclone and landslides.

UNIT-III

Social issues and the Environment:

- From unsustainable to sustainable development.
- Urban problems related to energy.
- Water conservation, rain water harvesting, watershed management.
- Resettlement and rehabilitation 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.
- Environmental protection laws in India.
- Population growth, variation among nations.
- Population explosion – family welfare programmes.
- Environment and Human Health.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

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(v).....

(vi).....

(vii).....

(viii).....

(ix).....

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(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination: *MM: 70*

1. The Question paper shall be of ***TWO HOURS*** duration.
2. Q. No. 1 shall contain 20 (Twenty) objective type questions having four options, out of which one shall be correct. Each question shall carry one mark. (1 X 20 = 20 marks)
3. Q. No. 2 shall contain 8 (Eight) Short-Answer-Type-Questions. Word limit for each question is 100 words. **Candidate has to attempt any five**. Each question shall carry **Four** marks. (5 X 4 = 20 marks).
4. Q. No. 3 shall contain 4 (Four) Essay-Type-Questions. Word limit for each question is 500 words. **Candidate has to attempt any two**. Each question shall carry **Fifteen** marks. (2 X 15 = 30 marks).

UNIT I

OPERATING SYSTEMS (Working knowledge at common users level only):
OVERVIEW OF IMPORTANT dos COMMANDS, Windows 98: Installation, Scandisk, Control Panel, Taskbar, Toolbars, Display settings (Background, wallpapers, screensavers, Desktop themes),Files and Folder management, Windows Explorer, Finding Files and Folders Formatting Disks and copying files, Printer settings, Modem installation, mouse installation, Adding and removing programmes, Active desktop Concepts, Winzip and its\application, Norton antivirus and its use, Use of calculator, Paintbrush, win amp, MPEG player and windows help.

UNIT II

Application Software (Working knowledge at common users level only):

(a) Word processing software – MS Word

Entering, editing and formatting text, Document formats (Page size and Orientation, Headers and Footers, Columns and Sections, Page layout), Spelling and grammer checks,

Thesaurus, Find and replace, cut and Paste, Table and Formatting tables, Mail Merge, Styles and Templates.

(b) Spreadsheet Programme – MS Excel

Entering data, Lables, Values, Dates, formulas, Cell references, formats, Functions, Templates, charts and Maps, analysing data in a spreadsheet.

(c) DBMS – Microsoft Access

Database, Entering data into the database, Creating database tables, editing data, viewing records, sorting records, querying a database, generating reports.

Format of the Question Paper

Q. 1 (Multiple Choice Question). Attempt all.

(i).....

(a) (b)

(c) (d)

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(ix).....

(x).....

(xi).....

(xii).....

(xiii).....

(xiv).....

(xv).....

(xvi).....

(xvii).....

(xviii).....

(xix).....

(xx).....

(1 X 20 = 20)

Q. 2 (Short Answer Type Question).Attempt any FIVE. Word limit 100 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(v).....

(vi).....

(vii).....

(viii).....

(5 X 4 = 20)

Q. 3 (Essay Type Question).Attempt any TWO. Word limit 500 words for each.

(i).....

(ii).....

(iii).....

(iv).....

(2 X 15 = 30)

B.Sc Semester I Chemistry Paper I P C 1004

Inorganic Chemistry

Scheme of examination: *MM: 23*

1. *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Covalent Bond : Valence bond theory and its limitations, directional and shapes of simple inorganic molecules and ions. Valence shell electron pair repulsion (VSEPR) theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2, H_2O.

UNIT – II

Covalent Bond : MO theory, homonuclear and heteronuclear (CO and NO) diatomic molecules, multicener bonding in electron deficient molecules bond strength and bond energy, percentage ionic character from dipole moment and electro negativity difference.

UNIT – III

Ionic Solids : Ionic structures, radius ratio effect and coordination number, limitation of radius ration rule, lattice defects, semiconductors, lattice energy and Born haber cycle, solvation energy and solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule.

UNIT – IV

Ionic Solids: Metallic bond free electron, valence bond and band theories.

Weak Interactions: Hydrogen bonding, Wander Walls forces.

UNIT – V

S-Block Element - Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in bisystems, an introduction to alkyls and aryls.

Organic Chemistry

Scheme of examination: *MM: 23*

1 *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Mechanism of Organic Reactions : Curved arrow notation, drawing electron movement with arrows, half-headed and double headed arrows, homolytic and heterolytic bond breaking. Types of reagents, electrophiles and nucleophiles. Types of organic reactions. Energy considerations. Reactive intermediates - carbocations, carbanions, free radicals, carbenes, arynes and nitrenes (with examples). Assigning formal charges on intermediates and other ionic species.

Methods of determination of reaction mechanism (product analysis, intermediates, isotope effects, kinetic and stereochemistry studies).

UNIT - II

Alkanes: IUPAC nomenclature of branched and unbranched alkanes, the alkyl group, classification of carbon atoms in alkanes, Isomerism in alkanes, sources, methods of formation (with special reference of Wurtz reaction, Kolbe reaction, Corey house reaction and decarboxylation of carboxylic acids). Physical properties and chemical reaction of alkanes. Mechanism of free radical halogenations of Alkanes: orientation, reactivity and selectivity.

UNIT - III

Alkenes: Nomenclature of alkenes, methods of formation, mechanism of dehydration of alcohols and dehydrohalogenation of alkyl halides, regioselectivity in alcohol dehydration. The Saytzeff rule, Hofmann elimination, physical properties and relative stabilities of alkenes.

Chemical reactions of alkenes - mechanisms involved in hydrogenation, electrophilic and free radical additions, Markownikoff's rule, hydroboration oxidation oxymercuration - reduction. Epoxidation, ozonolysis, hydration, hydroxylation and oxidation. with $KMnO_4$, Polymerization of alkenes. Substitution at the allylic and vinylic positions of alkenes. Industrial applications of ethylene and propene.

UNIT – IV

Alkynes: Nomenclature, structure and bonding in alkynes. Methods of formation, Chemical reactions of alkynes, acidity of alkynes, mechanism of electrophilic and nucleophilic addition reaction, hydroboration-oxidation, metal-ammonia reduction, oxidation and polymerization.

Dienes: Nomenclature and classification of dienes : isolated, conjugated and cummulated dienes. Structure of allenes and butadiene, methods of formation, polymerization, Chemical reaction-1,2 and 1,4 additions, Diels- Alder reaction.

UNIT – V

Cycloalkanes: Nomenclature, methods of formation. Chemical reactions,Baeyer's strain theory and its limitations. Ring strain in small rings(Cyclo-propane and Cyclo-butane), Theory of strainless rings. The case of Cyclopropane ring: banana bonds.

Cycloalkenes: Methods of formation, conformation and chemical reactions of Cycloalkenes.

Physical Chemistry

Scheme of examination: *MM: 24*

1 *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Mathematical Concepts : Lorgarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of function like kx, ex, xn, sin x and log x; maxima and Minima, partial differential and reciprocity relations, integration of some useful/relevant functions; permutations and combinations, Factorials, Probability.

UNIT - II

Computers : General introduction to computers, different computer of a computer, hardware and software, input-output devices; binary numbers and arithmatic, introduction to computer languages. Programming, operating systems.

UNIT - III

Gaseous States : Postulates of kinetic theory of gases, deviation from ideal behaviour, Vander Waals equation of state.

Critical Phenomena : PV isotherms of real gases; continuity of states, the isotherms of Van der Waals equation, relationship between cirtical constants and Vander Waals constants, the law of corresponding states, reduced equation of state.

UNIT - IV

Molecular velocities : Root means square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision number, means free path and collision diameter. Liquification of gases (based on Joule-Thomson effect).

UNIT - V

Liquid State - Intermolecular forces, structure of liquids (a qualitative description).

Structural differences between solids, liquids an gases.

Liquid crystals : Difference between liquid crystal, solid and liquid.

Classification, Structure of nematic and cholestric phases.

B.Sc Semester II Chemistry Paper I P C 2004

Inorganic Chemistry

Scheme of examination: *MM: 23*

1 *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Periodicity of p-Block Elements: Periodicity in properties of p-Block Elements with special reference to atomic and ionic radii, ionization energy.

UNIT – II

Periodicity of p-Block Elements: Electron affinity, electronegativity, catenation (including diagonal relationship).

UNIT – III

Some important compounds of p-Block Elements: Hydrides of boron diborane and higher boranes, borazine, borohydrides, fullerenes, carbides

UNIT – IV

Some important compounds of p-Block Elements: Fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

UNIT – V

Chemistry of Noble Gases -Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.

B.Sc Semester II Chemistry Paper II P C 2005

Organic Chemistry

Scheme of examination: *MM: 23*

1 *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Stereochemistry of Organic Compounds: Concept of isomerism. Type of isomerism.

Optical Isomerism - Elements of symmetry, molecular chrirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers , chiral and achera molecules with two steropgenic centres diastereomers, threo and erythro diastereomers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, D & L and R & S systems of nomenclature.

UNIT – II

Geometric Isomerism : Determination of configuration of geometric isomers. E & Z system of nomenclature, geometric isomerism in oximes and alicylic compound.

Conformational isomerism: Conformational analysis of ethane and n-butane, conformation of mon subsituded cyclohexane derivatives. Newman projection and Sawhorse formulae, Fischer and flying wedge formulae. Difference between configurational conformation.

UNIT – III

Arenes and Aromaticity : Nomenclature of benzene derivatives. The aryl group, aromatic nucleus and side chain. Structure of benzene: molecular formula ad kekule structure. Stability and carbon-carbon bond

lengths of benzene, resonce structure, MO picture.

Aromaticity: The Huckel huckel rule, aromatic ions.

UNIT – IV

Aromatic electrophilic substituion - general pattern of the mechanism, role of sigma and pi complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substitutents, orientation and orgho/para ratio. Side chain reactions of benzenes derivatives. Birch reduction.

UNIT – V

Alkyl and Aryl Halides: Nomenclature and classes of alkyl halides, methods of formation, chemical reaction. Mechanism of nucleophilic substitution reactions of alkyl halides, SN2 and SN1 reactions with energy profile diagrams.

Polyhalogen compounds : Chloroform, Carbon tetrachloride. Methods of formation of aryl halides, nuclear and side chain reactions. The addition - elimination and the elimination-addition mechanism of nucleophilic aromatic substitution reactions.

Relatives reactivities of alkyl halides vs allyls, vinyl and aryl halides.

Synthesis and uses of DDT and BHC

Physical Chemistry

Scheme of examination: *MM: 24*

1 *In Semester End Examination there will be 10 questions in all, 2 from each unit. Candidate has to answer any 5 questions, taking one from each unit.*

UNIT – I

Solid State: Definition of space lattice, unit cell. Laws of crystallograph- (i) Law of constancy of interfacial angles (ii) Law of rationality of indices (iii) Law of symmetry, Symmetry elements in crystals. X-ray diffraction by crystals. Derivation of Bragg's equation. Determination of crystal structure of NaCl, and CsCl (Laue's method and powder method).

UNIT – II

Colloidal State - Definition of colloids, classification of colloids. Solids in liquids (sols) : Properties - kinetic, optical and electrical; stability of colloids, protective action. Hardy-Schulze law, Gold number.

Liquids in solids (gels) : Classification, preparation and properties, inhibition, general application of colloids.

UNIT – III

Chemical Kinetics and Catalysis :Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction Concentration dependence of rates, mathematical characteristics of simple chemical reactions - zero order, first order, second order pseudo order, half life and means life. Determination of the order of reaction - differential method, method of integration , method of half life period and isolation method.

UNIT - IV

Radioactive decay as a first order phenomenon. Experimental methods of chemical kinetics : conductomertric, potentiometric, optical methods,

polarimetry and spectrophotometry. Theories of chemical kinetics: effect of temperature on rate of reaction,

UNIT - V

Arrhenius equation, concept of activation energy. Simple collision theory based on hard sphere model transition state theory (equilibrium hypothesis). Experession for the rate constant based on equilibrium constant and thermodynamic aspects.

B.Sc Semester I Maths Paper I P C 1007

DISCRETE MATHEMATICS

Scheme of examination: **MM: 35**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

Sets and propositions, Cardinality, mathematical induction, principle of inclusion and exclusion. Computability and formal languages- ordered set, Languages, phrase, structure, grammars, Types of grammars and languages.

UNIT - II

Relations and functions; Binary relations, equivalence relations and partitions. Partial ordered relations and lattices chains and antichains. Pigeons hole principle.

UNIT - III

Finite state machine: equivalent machines. Finite state machines as language recognizers. Discrete numeric functions and generating functions. Recurrence relation and recursive algorithms, linear recurrence relations with constant coefficients.

Homogeneous solutions. Particular solution. Total solution. Solution by the method of generating function.

UNIT - IV

Boolean algebras-lattices and algebra structure, duality, distributive compliment lattices. Boolean lattices, Boolean function and expressions.

B.Sc Semester I Maths Paper II P C 1008

DIFFERENTIAL CALCULUS

Scheme of examination: **MM: 35**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

Series : Infinite series and convergent series, test for convergence of a series; comparison test, D' Alembert's test Cauchy's test, Raabe's test, De-Morgan and Bertrand's test, Cauchy's condensation test, gauss test, alternating series, absolute convergence (derivation of test is not required).

UNIT - II

Taylor' s theorem. Machlaurin's theorem, power series expansion of sin x, cos x, e^x, $\log_e (1+x)$, $(1 - x)^n$, derivative of the length of an arc, pedal equations.

UNIT - III

Curvature. Asymptotes,

UNIT - IV

Multiple points, curve tracing of standard curves (Cartesian and polar coordinates), Envelopes.

B.Sc Semester I Maths Paper III P C 12-1009

THREE DIMENSIONAL GEOMETRY

Scheme of examination: **MM: 35**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

Sphere

UNIT - II

Cone, Cylinder.

UNIT - III

Central conicoids; ellipsoid, hyperboloid of one and two sheets condition of tangency for a plane, normals plane sections

UNIT - IV

Generating lines of hyperboloid of one sheet and its properties. Reduction of a general equations of second degree in three dimensions standard forms.

B.Sc Semester II Maths Paper I P C 2007

GRAPH THEORY

Scheme of examination: **MM: 35**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

Groups, Rings, Fields (Definitions, simple examples and elementary properties only).

UNIT II

Graphs - Basic terminology, Multigraphs, Union, Join, Product and composition of graphs. Weighted Graphs.

UNIT III

Paths and circuits, shorted paths, Eularian paths and circuits. Travelling salesman problems, Planar graphs and Geometric dual graphs.

UNIT IV

Trees, Rooted tree. Digraphs - Simple digraph, Asymmetric digraphs, Symmetric digraphs and complete digraphs. Digraph and Binary relations. Matrix representation of graphs and digraphs.

B.Sc Semester II Maths Paper II P C 2008

INTEGRAL CALCULUS

Scheme of examination: **MM: 35**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

Partial derivatives. Chain rules, Euler's theorem for homogeneous functions. Differentiation of implicit functions. Maxima and Minima of functions of two variables. Lagrange's multipliers.

UNIT II

Double integrals, Change of order of integration.

UNIT III

Triple integrals, Dirichlet's integral, Areas.

UNIT IV

Lengths, Volumes and Surfaces.

B.Sc Semester II Maths Paper III P C 2009

OPTIMIZATION THEORY

Scheme of examination: **MM: 22**

Note: In all five questions are to be answered. First question will be short answer type, compulsory and will cover the entire syllabus. There shall be two questions from each unit. A student has to answer at least one question from each unit.

UNIT - I

The linear programming problem Formulation. L.P.P. matric notation. Graphical solution of linear programming problems. Basic solution. Some basic properties of convex sets, Theorems based on convex sets.

UNIT II

Fundamental theorem of L.P.P. Application of the Simplex method for solution of a L.P.P. to simple problems.

UNIT III

Duality. Fundamental theorem of duality, Properties and Simple problems of duality.

UNIT IV

Assignment problems, Transportation problems.

MECHANICS – I

Scheme of examination: *MM: 23*

1. *In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.*

UNIT-I

Physical Laws and Frames of Reference: Transformation of displacement, velocity and acceleration between different frames of reference involving translation and rotation. Uniform relative motion. Inertial frames of reference-examples, Galilean transformations and invariance of Newton's laws. Non Inertial frames and their Examples.

UNIT-II

Special Theory of Relativity: Michelson-Morley's experiment, postulates of special theory of relativity, Lorentz transformations, transformation of velocity and acceleration, Addition of velocities, time dilation and length contraction. Experimental verification of time dilation. Some important results of special theory of relativity.

UNIT-III

Relative Rotational Motion: Transformation of velocity and acceleration between rotating frames, pseudo forces, coriolis forces, Motion relative to earth, Effects of centrifugal and Coriolis force on motion relative to earth. Foucault's pendulum.

UNIT-IV

Rigid Body Dynamics: Equation of motion of a rotating body. Inertial coefficients. Moments of Inertia of a disc. Cylinder and sphere. Case of

angular momentum not parallel to angular velocity. Kinetic energy of rotation and idea of principle axes. Precessional motion of spinning top.

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Incharge
Deptt. of Physics
R R College AT

ELECTROMAGNETISM – I

Scheme of examination: *MM: 23*

1. *In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.*

UNIT-I

Vector Fields: Partial derivative. Gradient of a scalar function. Line intergral of vector field. Potential difference and potential function. Potential energy of a system, Application: energy required to build a uniformly charged sphere, classical radius of an electron, potential and field due to short dipole, torque and force on a dipole in a Z external field.

UNIT-II

Divergence and Curl of a vector field: Divergence of a vector field. Divergence in the Cartesian coordinates, concepts of solid angle. Gauss divergence theorem, Gauss law in differential form, Gauss law from inverse square law, physical meaning of divergence of a vector, the Laplacian operator. Poision's and Laplace's equations. Curl of a vector field, Curl in Cartesian coordinates, Stoke's theorem, physical meaning of Curl.

UNIT-III

The Field of Moving Charge: Magnetic force, Measurement of charge in motion, Invariance of charge. Electric field measured in different frames of reference. Field of a point charge moving with constant velocity, Force on a moving charge, Interaction between a moving charge and other moving charges.

UNIT-IV

Electric Field in Matter: The Moments of a charge distribution. Atomic and molecular dipoles. Atomic polarizability. Permanent dipole moment, dielectrics. The Capacitor filled with a dielectric. The potential and field due to a polarized sphere. Dielectric sphere places in a uniform field, the field of charge in dielectric medium and Gauss's Law. The connection between electric susceptibility and atomic polarizability. Polarization in changing field. The bound charge (polarization) current.

—X—

Incharge
Deptt. of Physics
R. R. College, ALWAR

WAVE AND OSCILLATIONS – I

Scheme of examination: *MM: 24*

1. *In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.*

UNIT-I

Simple harmonic and anharmonic Oscillators: Oscillations in an arbitrary potential well, Simple harmonic motion, examples-mass on a spring, LC Circuit, torsional oscillator, mass and two spring system. Energy of the oscillators. Anharmonic oscillator, simple pendulum as an example.

UNIT-II

Damped harmonic oscillators: Damped harmonic oscillators, mathematical formulation of damped harmonic oscillators Energy of damped harmonic oscillator, Power dissipation, relaxation time, Quality factor of damped harmonic oscillators. Examples – Electromechanical system-Ballistic galvanometer. Damped oscillation in LCR Circuit.

UNIT-III

Driven harmonic oscillators: Driven harmonic oscillators. Mathematical formulation of driven harmonic oscillator. Frequency response on amplitude and phase, Quality factor of driven harmonic oscillators, Resonance, Sharpness of resonance, Power absorption by forced oscillator. Series and parallel LCR Circuit.

Incharge
Deptt. of Physics
R. R. College, ALWAR

UNIT-IV

Coupled Oscillators: Equation of motion of two coupled S. H. Oscillators, Normal modes, motion in mixed modes, Transient behavior, Effect of coupling in mechanical systems. Electrically coupled circuits, frequency response, reflected impedance. Effect of coupling and resistive load.

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MECHANICS - II

Scheme of examination: *MM: 23*

1. ***In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.***

UNIT-I

Conservation Laws: Conservative forces, Potential energy, potential energy in gravitational and electrostatic field. Rectilinear motion under conservative forces. Discussion of potential energy curves and motion of a particle. Centre of Mass. Two particle system. Motion of centre of mass and reduced mass. Application of reduced mass: Reduced mass of hydrogen atom, Reduced mass of deuteron, Reduced mass of earth and satellite.

UNIT II

Conservation of linear and angular momentum: Conservation of linear momentum Collision of two particles in one and two dimensions (elastic and inelastic). Slowing down of neutrons in a moderator. Motion of a system with varying mass (Rocket). Angular momentum conservation and charged particle scattering by a nucleus as an example.

UNIT III

Motion under Central Forces : Motion under central forces. Gravitational interaction, intertia and gravitational mass, general solution under gravitational interaction. Rutherford scattering, Discussion of trajectories, Cases of elliptical and circular orbits, Kepler's Laws.

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UNIT IV

Elastic properties of Matter : Elasticity, Young's Modulus, Bulk modulus, Modulus of rigidity, Poisson's ratio and their relations. Bending of a beam. Torsion of a cylinder, experimental determination of elastic constants.

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ELECTROMAGNETISM - II

Scheme of examination: *MM: 23*

1. ***In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.***

UNIT-I

The Magnetic Field : The definition of magnetic field, properties of the magnetic field. Ampere's circuital law with application. Ampere's Law in differential from. Vector potential. Poissions equation for vector potential. Field of any current carrying wire and deduction of Biot-Savart Law.

UNIT II

Magnetic Fields in Matter: Electric current due to an orbiting electron, the field of current loop, Bohr magneton. Orbital gyromagnetic ratio. Electron spin and magnetic moment. Magnetic susceptibility, magnetic field caused by magnetized matter. magnetization current. Free current and the field H.

UNIT III

Electromagnetic Induction: Faraday's law of Electromagnetic Induction in integral and differential form. Lenz's law Self and mutual induction. Transformer, measurement of self inductance by Rayleigh's method. Energy stored in magnetic field.

UNIT IV

Transient Currents and Maxwell's Equations: Transient behaviour of an R-C circuit, determination of high resistance by leakage method. Transient

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behaviour of an R-L circuit, the displacement current. Maxwell's equations in differential and integral forms.

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WAVES AND OSCILLATIONS - II

Scheme of examination: *MM: 24*

1. *In all five questions are to be answered. There shall be two questions from each unit. A student has to answer one question from each unit. Fifth question will be compulsory and will cover the entire syllabus.*

UNIT I

Lattice Vibrations: Concept of group and phase velocities, Equation of motion for one dimensional monoatomic and diatomic lattices, acoustic and optical modes, dispersion relations.

UNIT II

Electrical transmission line: transmission line, transmission line equation, propagation constant, characteristic impedance, standing waves and standing wave ratio, effect of terminal load.

UNIT III

Elastic waves in a solid rod, Pressure waves in a gas column. Transverse waves in a string, waves in three dimensions, spherical waves, Fourier series and determination of Fourier constants, Fourier analysis of a square, saw tooth and triangular wave forms.

UNIT IV

Electromagnetic Waves: Plane electromagnetic waves. EM waves in an isotopic medium. Properties of EM waves, Energy density of EM waves. Momentum density of EM wave. Radiation pressure. Radiation resistance of free space, EM waves in dispersive media. Spectrum of electromagnetic radiations. -----X-----

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