

NEW SYLLABUS

राजर्षि महाविद्यालय, अलवर

बी.एस.सी प्रथम वर्ष प्रथम सेमेस्टर

सामान्य हिन्दी PC 22-101

समय: 2 घण्टे

पूर्णांक 70 अंक

नोट:- इस प्रश्नपत्र में प्राप्त अंको को श्रेणी निर्धारण हेतु नहीं जोडा जायेगा।

प्रश्नपत्र में दो भाग होंगे-1. साहित्य खण्ड 2. व्याकरण खण्ड

साहित्य खण्ड में दो भाग होंगे- गद्य भाग एवं पद्य भाग

साहित्य खण्ड (गद्य भाग)

गद्य भाग

1. प्रेमचन्द - नमक का दारोगा (कहानी)
2. महादेवी - प्रणाम (संस्मरण)
3. बनारसी दास चतुर्वेदी - बाईस वर्ष बाद (रेखाचित्र)
4. गुणाकर मुले - शनि सबसे सुन्दर ग्रह (विज्ञान)
5. पद्य भाग

पद्य भाग

1. कबीर - 20 साखिया, कबीर ग्रथावली - सं. डॉ श्यामसुन्दरदास
 - (i) गुरुदेव कौ अंग -3,11,12,22,-(साखी नं.)
 - (ii) बिरह कौ अंग -5,11,31,32,-(साखी नं.)
 - (iii) करणी बिन कथनी -5 ,-(साखी नं.)
 - (iv) भ्रम बिधौसण कौ अंग -10 ,-(साखी नं.)
 - (v) भेष कौ अंग -5,12 ,-(साखी नं.)
 - (vi) कुसंगति कौ अंग - 1,7 ,-(साखी नं.)
 - (vii) कसतूरिया मृग कौ अंग -1 ,-(साखी नं.)
 - (viii) चितावनी कौ अंग -1 ,-(साखी नं.)
 - (ix) साध कौ अंग -1 ,-(साखी नं.)
 - (x) उपदेश कौ अंग -9, -(साखी नं.)

की. बी. प्रीता

डॉ. उमेश कुमार राय (उमेश कुमार)


(xi) काल कौ अंग -1, 4 -(साखी नं.)


2. सूरदास-वात्सलय वर्णन, सूरसागर-दशम स्कन्ध पद संख्या-43,75,99,108,249,344
3. तुलसीदास -कवितावली सं. रामचन्द्र शुल्क-नागरी प्रचारिणी सभा
 - (1) पुरतें निकसी रघुबीर बधू
 - (2) जल को गए लखन
 - (3) वनिता बनी स्यामल गौर
 - (4) रानी में जानी अजानी
 - (5) सीस जटा उर बाहुविसाल
 - (6) सूनि सुंदर बैन सुधारस साने
4. रहीम- 10 दोहे रहीम ग्रंथावली-पं. विद्यानिवास मिश्र
 - (1) प्रीतम छवि नैनन बसी
 - (2) बसि कुसग चाहत कुसल
 - (3) रहिमन अंसुना नयन ढरि
 - (4) रहिमन औछे नरन सो
 - (5) रहिमन निजमन की व्यथा
 - (6) काज परै कछु और हैं
 - (7) रहिमन धागा प्रेम का
 - (8) पावस देखि रहीम मन
 - (9) रूठे सुजन मनाइये, जो रूठे सौ बार
 - (10) रहिमन पानी राखिए, बिन पानी सबसून

(ब) व्याकरण खण्ड

1. निबंध लेखन (विकल्प देय एवं शब्द सीमा 300 शब्द) 8 अंक
2. कार्यालयी पत्र/अर्द्धशासकीय पत्र/परिपत्र/ज्ञापन/विज्ञप्ति/निविदा 4 अंक
3. संक्षेपण 4 अंक
4. पल्लवन 4 अंक
5. उपसर्ग, संधि, प्रत्यय, समास 4 अंक
6. वाक्य शुद्धि/शब्द शुद्धि 4 अंक
7. मुहावेर/लोकोक्तियाँ 4 अंक


वी.वी.मेठा


(370 उमेश कुमार)


(उमेश कुमार)

NEW SYLLABUS

राजर्षि महाविद्यालय, अलवर

बी.एस.सी प्रथम वर्ष द्वितीय सेमेस्टर

सामान्य हिन्दी PC 22-201

समय: 2 घण्टे

पूर्णांक 70 अंक

नोट:- इस प्रश्नपत्र में प्राप्त अंको को श्रेणी निर्धारण हेतु नहीं जोडा जायेगा।

प्रश्नपत्र में दो भाग होंगे-1. साहित्य खण्ड 2. व्याकरण खण्ड

साहित्य खण्ड में दो भाग होंगे- गद्य भाग एवं पद्य भाग

(अ) साहित्य खण्ड (गद्य भाग)

1. हरिशंकर परसाई- भोलाराम का जीव (व्यंग्य)
2. भारत भूषण अग्रवाल- महाभारत की एक सांझ (एकांकी)
3. रामचन्द्र शुक्ल- उत्साह (ललित निबंध)

पद्य भाग

1. मैथिली शरण गुप्त- मातृभूमि वही मनुष्य है कि जो मनुष्य के लिए मरे
2. सुमित्रानंदन पंत- भारतमाता, पावस ऋतु में पर्वत प्रदेश
3. दिनकर -रश्मि रथी (तृतीय सर्ग से)
(सच है, विपत्ति जब आजी हैक्या कर सकती है चिनगारी)
4. नागार्जुन-अकाल और उसके बाद, बादल को घिरते देखा है।
गद्य व पद्य दोनों को एक ही पाठ्य पुस्तक में संकलित किया जाएगा।

(ब) व्याकरण खण्ड

- | | |
|--|-------|
| 1. पारिभाषिक, शब्दावली | 4 अंक |
| 2. संज्ञा, सर्वनाम, विशेषण, क्रिया, क्रिया विशेषण (व्यावाहारिक पक्ष) | 4 अंक |
| 3. शब्द युग्मों का अर्थ भेद | 4 अंक |
| 4. वाक्यांश के लिए एक शब्द | 4 अंक |
| 5. पर्यायवाची / विलोम शब्द | 4 अंक |

वी.वी. श्रीना

(डॉ. उमेश कुमार राव)

(उमेश कुमार)

अंक विभाजन:-


कुल चार संख्या 2 गद्य भाग से 2 X 5 =10

2 पद्य भाग से 2 X 5 =10



कुल चार आलोचनात्मक प्रश्न

2 गद्य भाग से 2 X 7 =14

2 पद्य भाग से 2 X 7 =14


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सो.वी. श्री.ग.


(डॉ. उमेश प्रभाकराव)

(उमेश उमर)

NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester I

GE

P C 22-102

GENERAL ENGLISH

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

MM: 70

Objectives:

- Reinforcing selected components of grammar and usages.
- Facilitating comprehension of a prose passage.

Unit – I(Vocabulary)

- Antonyms and Synonyms 10 Marks
- Word formation: Prefix and suffix.

Unit – II(Grammar and Usage – I)20 Marks

Transformation of sentences.

- Direct and Indirect Narration.
- Active and Passive Voice.
- Interchange of Degrees of Comparison.

Unit – III(Grammar and Usage – II)10 Marks

- Sequence of Tenses.
- Prepositions.

Unit – IV(Grammar and Usage – III)10 Marks

- Modal Auxiliaries.
- Articles.

Unit – V(Comprehension)20 Marks

- Comprehension of a passage from the prescribed book(Essential Language Skills by Macmillan)

Following essays and Stories in Essential Language Skills revised edition compiled by Macmillan for General English B.A./B.Com./B.Sc.

William Blake

The Little Black Boy

Sujata Bhatt

Voice of the Unwanted Girl

Ruskin Bond

Night Train at Deoli

M.K. Gandhi

The Birth of Khadi

J.L.Nehru A Tryst with Destiny

A.P.J.AbdulKalam

Vision for 2020

Five Questions to be answered from the texts mentioned.

Suggested Reading:

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

Dr. D.P. S. Yadav



Dr. P.C. Kambodig



Dr. S.S. Vaidya



Dr. Neeru Meena



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NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester II

GE

P C 22-202

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

Unit – I(Phonetics)

20 Marks

- Transcription of Phonetic symbols.
- Word stress.
- Translation of 5 sentences from Hindi to English
- Translation of 10 words from Hindi to English

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.

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.

Dr. O.P.S. Yadav

Dr P.C. Kumbodig

Dr. S.S. Naidwan

Dr. Neeru Meena









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R.R. Gillgash

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Raj Rishi Govt. Autonomous College

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NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester I

ENVS

P C 22-103

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, Relationship between Environmental Studies and other branches of science and social sciences.

Need for Environmental awareness, Environmental education in present day context.

Natural Resources and Challenges

Natural Resources and associated problems, Classification of resources: renewable resources, nonrenewable resources. Classes of earth resources, resources regions: Definition and criteria, resource conservation.

- 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.

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- 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-II

Ecosystems, Concepts, Structure, Functions and Types

- 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 and their types
 - ❖ Desert ecosystem with emphasis on Thar Desert
 - ❖ Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) and Wet Lands

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UNIT – III

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, aesthetic 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.
- Red Data Book




nbs. ~~Dr. J. S. Singh~~ ~~Dr. J. S. Singh~~

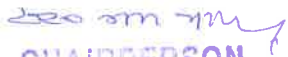
Dr. J. S. Singh 3-2

Suggested Readings:

1. Kanisk Pandey, Sports a way of life. Manas Publication, Allahabad U.P. 2007
2. Charles Bucher. Foundation of Phy. Education Engle wood cliffs N.J. Prentice Hall. U.S.A.
3. Ajmer Singh GS Gill Foundation of Physical Education, French Pub. New Delhi.
4. Dr. M.L. Kamlesh History and foundation of PE, Friends Publication
5. Chauchan, Surendra Singh. 2001. Biodiversity, Biopiracy and Biopolitics. The Global Perspectives, Kalinga Publications, New Delhi.
6. Diwan A.P. and Arora D.K. 1995 Human Ecology Anmol Publications Pvt. Ltd., New Delhi.
7. Dubey R.M. 1992 Human Ecology and Environmental Education, Chaug Publications, Allahabad.
8. Goudie, Andrew. The Human Impact
9. Husain Maxia 1994 Human Geography, Rawat Publications, Jaipur
10. Sinha Rajiv, 1996. Global Biodiversity Ina., Shri Publications, Jaipur

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R R College Alwar




Dr. L.K. Sharma


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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)

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NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester II

ENVS

P C 22-203

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

Environmental Pollutions and Control Measures

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, Role of an individual in prevention of pollution
Pollution case studies

3. Disaster management: Floods, earthquakes, cyclone and landslides.

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UNIT-II

Social issues, Environment, Laws and Sustainability

- 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.
- Air(Prevention and Control of Pollution) Act
- Wild life protection Act
- Forest Conservation Act
- Biological Diversity Act
- Issues involved in enforcement of environmental legislation
- Public Awareness

UNIT-III

Human Population and the Environment

- Population growth, variation among nations.
- Population explosion – family welfare programmes.
- Environment and Human Health.
- Human Rights
- Value Education
- HIV/AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and human health
- Case Studies

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3-4
मसि विज्ञान

Philosophy of Sports

- Define sports and physical education & classification of sports activities.
- Sports as a way of life.
- Development of social and moral values through sports.
- Sports and personality development.
- Team work and sports.
- Physiological changes in body through sports participation
- Peace through sports in the world.

Suggested Readings:

1. Kanisk Pandey, Sports a way of life. Manas Publication, Allahabad U.P. 2007
2. Charles Bucher. Foundation of Phy. Education Engle wood cliffs N.J. PrentiaHall. U.S.A.
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Chairman
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RR College Alwar

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Dr. L. K. Sharma

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)

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NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester I

ECA

P C 22-104

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination:

MM: 70

1. The Question paper shall be of **TWO HOURS** duration.
1. 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)**
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3. 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, , 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 – (RAM and ROM), Input and Output devices- Keyboard (The standard Keyboard layout), Mouse, Printers (Dot matrix, Inkjet, Laser Jet), Microphone, Speakers, Digital Cameras, Scanners, Storage devices – Diskette Drive (Types, Density, Formatting Boot Record, FAT, Folder, Directory), Hard Disk Drive, CD, DVD, Pen 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, Voice and video massaging, Video

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Conferencing, Online service user connection (Types), Networking of Computers, (Node, Client, Server, LAN, WAN), Working of 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 and features therein, use of search engines, Surfing, creating and use of email, Awareness about e-commerce and its advantages.

Amir

P.S.

A.A.

S.B.

NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester II

ECA

P C 22-204

ELEMENTARY COMPUTER APPLICATIONS

Scheme of examination:

MM: 70

1. The Question paper shall be of **TWO HOURS** duration.
4. 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)**
5. 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)**
6. 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: 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, 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 grammar checks, Thesaurus, Find and replace, cut and Paste, Table and Formatting tables, Mail Merge, Styles and Templates.

Am I P.S A.T S.M.A

(b) Spreadsheet Programme – MS Excel

Entering Data, Labels, Cell references, Values, Dates, formulas, formats, Functions, Templates, charts and Maps, Analyzing 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.

Amir

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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)

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NEW SYLLABUS

B.Sc/B.Sc (Hons.)

Semester I & II

ECA

P C 22-204

PRACTICALS: ELEMENTARY COMPUTER APPLICATIONS

MM: 50

The practical exercises will be designed to help in the understanding of concepts of computer and utilization in the areas outlined in the theory syllabus. The emphasis should be on practical usage rather than on theoretical concepts only.

The practical examination scheme should be as follows-

- Three practical exercises (including Attendance & Record performance)
 - Operating System
 - MS Word
 - MS Excel
 - Microsoft Access
 - Internet

3 X10 = 30

- Viva-voice

20

Amel *BP* *Amel* *S. S. M. K.*

NEW SYLLABUS
B.Sc. Semester - I

Scheme of examination

Continuous Assessment (CA)	=	15 Marks
Term Test	=	10 Marks
Home Assignment	=	05 Marks
Semester End Examination (SEE)	=	35 Marks
Total	=	50 Marks

B.Sc. Semester I Botany Paper I P C 22-1001

Algae, Fungi and Lichens

Scheme of examination:

MM: 35

1. In Semester End Examination the candidate has to answer five questions in all. Each question will be of 7 marks. Candidate has to answer all questions in the main answer book only.
2. Q. No. 1 will be compulsory having 07 short answer type questions (one mark each) covering entire syllabus.
3. Each paper is divided in four units. There will be two questions from each unit. Student has to answer one question from each unit.

UNIT - I

General characters of algae, Classification (F. E. Fritsch and Smith), Diverse habitat, Range of thallus structure, Photosynthetic pigments and food reserves. Reproduction (vegetative, asexual and sexual), Types of life cycles and evolution of sex in algae. Economic importance (algae as food and fodder, algae in agriculture, pharmaceuticals and industries). Isolation and culture of algae.

UNIT - II

Habitat, structure, reproduction and life cycle of following forms:

Chlorophyceae - Volvox, Coleochaete, Chara

Xanthophyceae - Vaucheria

Phaeophyceae - Ectocarpus

Rhodophyceae - Polysiphonia

UNIT - III

(Handwritten signatures and marks)

General characters of fungi: Definition, occurrence, thallus organization, asexual and sexual reproduction, biological and economic importance of fungi. Classification of fungi. (Saccardo and Ainsworth's).

UNIT - IV

Brief account, structure, importance and life history of the following:

Yeast, Rhizopus, Aspergillus, Peziza, Agaricus.

Lichens: General characters, habitat, structure, reproduction and economic importance of lichens, importance of lichens as colonizers and indicators of environment.

Suggested Readings:

- Bold, H. C. and Wayne, M. J. 1996. Introduction to Algae. 2nd Edition. Prentice Hall, Inc. Englewood Cliffs, New Jersey.
- Gilbert, M. S. 1985. Cryptogamic Botany. Vol. I and II second edition. Tata McGra Hill Publishing Co. Ltd., New Delhi.
- Kumar, H. D. 1998. Introductory Phycology. Affiliated East-West Press Ltd., New York.
- Lee, R.E. 2008. Phycology. Fourth Edition, Cambridge University Press, USA.
- Singh, V. Pandey, P. C. and Jain, D. K. 2001. A Text book of Botany. Rastogi Publication, Meerut.
- Van den Hoek, C., Mann, D.J. and Jahns, H.M. 1995. Algae: An introduction to Phycology. Cambridge Univ. Press., England.
- Vashitha, B. R. 2002. Botany for degree students (Algae and Bryophytes). S. Chand and Co. Ltd., New Delhi.
- Alexopoulos, C.J. and Mims, C.V. 1988. Introductory Mycology. John Wiley and Sons, New York.
- Dubey, H.C. 1989. Fungi. Rastogi publication, Meerut.
- Sarabhai, R.C. and Saxena, R.C. 1990. A textbook of Botany. Rastogi publication, Meerut.
- Vashishta, B. R. 2001. Botany for degree student's Fungi. S. Chand and company, New Delhi.

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- Webster, J. and Weber, R. 2007. Introduction to Fungi. 3rd edition, Cambridge University Press, Cambridge.

B.Sc. Semester I Botany Paper II P C 22-1002

Microbiology and Plant Pathology

Scheme of examination:

MM: 35

1. In Semester End Examination the candidate has to answer five questions in all. Each question will be of 7 marks. Candidate has to answer all questions in the main answer book only.
2. Q. No. 1 will be compulsory having 07 short answer type questions (one mark each) covering entire syllabus.
3. Each paper is divided in four units. There will be two questions from each unit. Student has to answer one question from each unit.

UNIT - I

Meaning and scope of **microbiology**, Developments in the field of microbiology, spontaneous generation, discovery of bacteria, germ theory of diseases, Vaccination, Antibiotics.

General account of Eubacteria: occurrence, morphology (structure, shapes), flagella, capsule, nutritional types, endospore, reproduction (binary fission, transformation, conjugation, transduction), economic and biological importance.

UNIT - II

Mycoplasma: occurrence, morphology, reproduction and importance.

Virus: General characteristics and importance. Structure of TMV and Pox virus.

Structure and multiplication of bacteriophage.

Cyanobacteria: *Oscillatoria* and *Nostoc*, occurrence, morphology, reproduction and importance.

UNIT - III

What is plant disease? Animate and inanimate plant diseases. Important symptoms of plant diseases caused by fungi, bacteria, viruses, MLO's (blights, mildew - downy and powdery, rust, smut, mosaic, little leaf, galls etc.)

Handwritten signatures and marks:
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Brief account, structure, importance and life history and/or disease cycle and control of the following:

Albugo and white rust. **Sclerospora** and downy mildew/ green ear of Bajra.

Claviceps and ergot.

UNIT – IV

Brief account, structure, importance and life history and/or disease cycle and control of the following:

Puccinia and rusts of wheat (Black, orange, yellow)

Ustilago and loose smut of wheat and covered smut of barley.

Alternaria and early blight of tomato/potato.

Suggested Readings:

- Agrawal, K. and Sharma, J. 2014. A Text book of Mycology, Microbiology and Plant Pathology. CBH publisher, Jaipur.
- Aneja, K. R. 2003. Experiment in Microbiology, Plant Pathology and Biotechnology. New age international (P) Ltd. Publishers, New Delhi.
- Biswas, S. B. and Biswas, A. 2000. An introduction of Viruses. Vikas publications, New Delhi.
- Dubey, R. C. and Maheshwari, D. K., 2002. A Text Book of Microbiology. S. Chand and Co., New Delhi. 8
- Kumar, H. D. and Kumar, S. 1998. Modern Concepts of Microbiology. Vikas publishing house Pvt. Ltd., New Delhi.
- Madahar, C. L. 2001. Introduction of Bacteria. Mc Graw Hill Edu. Pvt. Ltd., London.
- Mckane, L. and Judy, K. 1996. Microbiology: Essentials and Applications. McGraw Hill, New York.
- Pandey, S. N. and Trivedi, P. C. 2005. A text book of Fungi, Bacteria and Virus. Vikas Publishing House, New Delhi.
- Pelczar, M.J. Microbiology. 5 th edition, Tata Mc Graw-Hill Co., New Delhi.
- Prescott, L., Harley, J. and Klein, D. 2005. Microbiology. 6 th edition, Tata Mc Graw-Hill Co., New Delhi.



- Purohit, S. S. 2002. Microbiology. Agro. Bot. Publication, Jodhpur.
- Sharma, P. D. 2003. Microbiology and Pathology. Rastogi Publication, Meerut.
- Singh, V. and Srivastava, V. 1998. Introduction of Bacteria. Vikas Publication, New Delhi.
- Singh, R. P. 2010. Microbiology. Kalyani Publishers, New Delhi.

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NEW SYLLABUS
B.Sc. Semester - II

Scheme of examination

Continuous Assessment (CA)	=	15 Marks
Term Test	=	10 Marks
Home Assignment	=	05 Marks
Semester End Examination (SEE)	=	35 Marks
Total	=	50 Marks

B.Sc. Semester II Botany Paper I P C 22-2001

Bryophytes and Pteridophytes

Scheme of examination:

MM: 35

1. In Semester End Examination the candidate has to answer five questions in all. Each question will be of 7 marks. Candidate has to answer all questions in the main answer book only.
2. Q. No. 1 will be compulsory having 07 short answer type questions (one mark each) covering entire syllabus.
3. Each paper is divided in four units. There will be two questions from each unit. Student has to answer one question from each unit.

UNIT - I

Bryophyta: General characters, Origin and evolution of Bryophyta. Classification (Eichler and Proskauer) Habitat, Range of thallus structure, Reproduction (Vegetative and Sexual) Alternation of generation, Evolution of sporophytes in Bryophytes, Economic importance of Bryophytes.

UNIT II

Habitat, structure, reproduction and alternation of generation in following forms:

Hepaticas - Riccia, Marchantia and Porella.

Anthocerotopsida - Anthoceros.

Bryopsida - Sphagnum, Funaria

UNIT III

Pteridophyta: General characters of pteridophytes, classification by Smith, Bold & Sporne.

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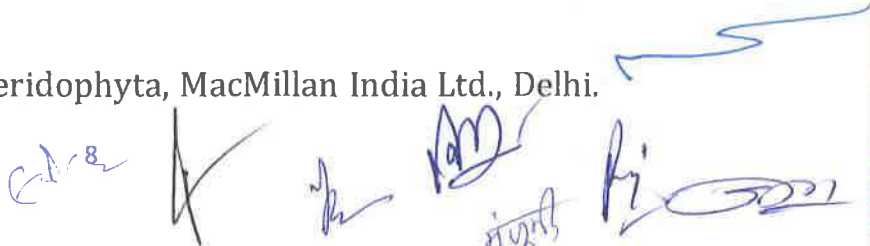
Important characteristics of Psilopsida, Lycopsidea, Sphenopsida and Pteropsida. Economic importance of Pteridophytes. Alternation of Generation. Stellar system in Pteridophytes. Heterospory and seed habit.

Unit – IV

Distribution, structure and life history of
Psilotum, Selaginella, Equisetum, Pteridium and Marsilea.

Suggested readings

- Chopra, R.N. and Kumar, P.K. 1988. Biology of Bryophytes. Wiley Eastern Ltd. New Delhi.
- Pandey, S.N., Mishra, S.P. and Trivedi, P.S. 1981. A text book of Botany vol. II, Vikas publishing House Pvt. Ltd, New Delhi.
- Parihar, N.S. 1965. An Introduction to Bryophyta. Central Book Depot, Allhabad.
- Puri, P. 1985. Bryophytes. Atmaram and Sons, Delhi.
- Smith, G.M. 1938. Cryptogamic Botany Vol. II. Bryophytes and Pteridophytes. Mc Graw Hill Book Company, London.
- Sporne, K.R. 1967. The Morphology of Bryophytes. Hutchinson University Library, London.
- Tyagi, A. and Saxena, M. 2014. Algae, Lichens and Bryophyta, CBH, Jaipur
- Vashishta, B. R., Sinha, A. K. and Kumar, A. 2011. Botany for degree students, Bryophyta. S. Chand and Co. New Delhi.
- Watson E.V. 1971. The structure and life of Bryophytes. Hutchinson University Library, London
- Bierhorst, D.W. 1971. Morphology of Vascular Plants. MacMillan Co., N.Y. and CollierMacMillan Ltd., London.
- Parihar, N.S. 1996. The Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad.
- Singh, V., Pandey, P. C. and Jain, D. K. 2013. A text book of Botany. IV edition, Rastogi publication, Meerut.
- Sharma, O. P. 1990. Textbook of Pteridophyta, MacMillan India Ltd., Delhi.



- Vashishta, P.C. 1997. Botany for Degree Students- Pteridophyta. S. Chand and Company, New Delhi.
- Wilson, N. S. and Rothewall, G. W. 1993. Paleobotany and Evolution of Plants. (2nd Edition), Cambridge University Press, U. K.

B.Sc. Semester II Botany Paper II P C 22-2002
Gymnosperms and Palaeobotany

Scheme of examination:

MM: 35

1. In Semester End Examination the candidate has to answer five questions in all. Each question will be of 7 marks. Candidate has to answer all questions in the main answer book only.
2. Q. No. 1 will be compulsory having 07 short answer type questions (one mark each) covering entire syllabus.
3. Each paper is divided in four units. There will be two questions from each unit. Student has to answer one question from each unit.

UNIT-I

Resemblances and characteristics of seed plants. Differences between Gymnosperms and Angiosperms. General characters and classification of Gymnosperms (Andrews, Sporne & Bierhorst), Economic importance of Gymnosperms.

UNIT-II

Systematic position, distribution, Morphology of Vegetative and reproductive parts, anatomy, reproduction and life cycle of following genera:

Cycas, Pinus and Ephedra

UNIT- III

Formation of fossils, types of fossils, techniques of study of fossils. Geological time scale. Applied aspects of paleobotany - use in coal and petroleum exploration.

UNIT -IV

Fossil Pteridophytes: Rhynia, Lepidodendron, Calamites, Lepidocarpon.

Fossil Gymnosperms: Cycadeodea, Cordaites, Williamsonia.

Suggested Readings:

- Bhatnagar, S. P. and Moitra, A. 1997. Gymnosperms. New Age International (P) Ltd., Publisher, New Delhi.

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- Clark, D. L. 1976. Fossils, Palaeobotany and Evolution. W.M.C. Brown Company, New York.
- Meyen, S. V. 1978. Fundamentals of Palaeobotany. Chapman and Hall, London.
- Sharma, O. P. 1997. Gymnosperms. Pragati Prakashan, Meerut, India.
- Sporne, K. R. 2002. The Morphology of Gymnosperms. B. I. Pub. Pvt. Ltd. Mumbai, Kolkata, Delhi.
- Thomas, B. A. and Spice, R. A. 1986. The Evolution and Palaeobotany of land Plants. Publ. Crom. Helm London and Sydney.
- Vasishta P.C. 1980. Gymnosperms. S. Chand and Co. Ltd., New Delhi.

B. Sc. BOTANY PRACTICAL EXAMINATION

SEMESTER I & II

SKELETON PAPER

MAX. MARKS: 100

TIME 4 HOURS

Q. No.	Practical	Marks
1.	Make suitable stained glycerine preparation of any one alga from the given mixture 'A' Draw its labelled diagram, assign it to its systematic position giving reasons.	08
2.	Make suitable preparation of the reproductive structure of material "B" Draw labelled diagrams, identify giving reasons.	10
3.	Make suitable stained preparation of material 'C' (Vegetative/ Reproductive) Draw a labelled diagram, identify giving reasons.	10
4.	Make suitable preparation of material 'D' (Vegetative/Reproductive) Draw a labelled sketch, identify giving reasons.	10
5.	Make a suitable preparation of material "E" (Vegetative/Reproductive) Draw a labelled sketch, identify giving reasons.	10
6.	One microbiology experiment for comments or Gram staining.	08
7.	Comment upon the spots (1-6), Identify giving reasons (3 Minutes for each Spot)	24
8.	Viva-Voce	10
9.	Practical Record	10
	Total	100

Suggested Laboratory Exercises:

1. Microscopic preparations and study of the following algal material:
Nostoc, Oscillatoria, Volvox, Coleochaete, Vaucheria, Chara, Ectocarpus and Polysiphonia.
2. Study of class work material by making suitable temporary slides and study of permanent slides of:
Yeasts, Aspergillus, Peziza, Agaricus.
3. Study of Specimen, permanent slides and by making suitable temporary slides:
Albugo, Sclerospora, Claviceps, Ustilago, Puccinia Alternaria
4. Study of External morphology and preparations of slides of vegetative and reproductive parts of following Bryophytes: *Riccia, Marchantia, Anthoceros, Sphagnum.*
5. Study of External morphology and preparations of stained slides of vegetative and reproductive parts of following Pteridophytes: *Selaginella, Equisetum and Marsilea.*

Microscopic examination of fossil slides, specimen/photograph-

Rhynia, Lepidodendron, Calamites and Lepidocarpon.

6. Study of External morphology and preparations of suitable section of vegetative/ reproductive parts of following Gymnosperms: Cycas, Pinus and Ephedra

Cycas

- i. Study through permanent slides - normal root (T.S.), stem (T.S.) (if sections are not available show photographs), ovule (L.S.).
- ii. Study through hand sections or dissections - coralloid root (T.S.), rachis (T.S.), leaflet (T.S.), microsporophyll (T.S.), pollen grains (W.M.)

Pinus

- i. Study through permanent slides - root (T.S.), female cone (L.S.), ovule (L.S.), embryo (W.M.) showing polyembryonic condition.
- ii. Study through hand sections- young stem (T.S.), old stem (wood) (T.L.S. and R.L.S.), needle (T.S.), male cone (L.S.), male cone (T.S.), pollen grains (W.M.)

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J
K
L
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Q
R
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V
W
X
Y
Z

Ephedra

- i. Permanent slides - female cone (L.S.).
- ii. Hand sections/dissections - node (T.S.), internode (T.S.), male cone (T.S. and L.S.), pollen grains.

7. Study of bacteria using curd or any other suitable material by Gram staining of bacteria:

Study of Mycoplasma, TMV, Pox virus, bacteriophage (photographs)

Study of symptoms of plant diseases - Downy mildew of Bajra, Green ear of bajra, Mosaic of bhindi, White rust of crucifers, Loose smut of wheat and Covered smut of barley, Rusts of wheat.

NEW SYLLABUS

B.Sc Semester I Chemistry Paper I PC 22-1004

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, multicenter 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 ratio 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, Vander 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.

NEW SYLLABUS

B.Sc Semester I Chemistry Paper II P C 22-1005

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 cumulated 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.

NEW SYLLABUS

B.Sc. Semester I Chemistry Paper III P C 22-1006

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: Logarithmic 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

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 critical constants and Vander Waals constants, the law of corresponding states, reduced equation of state.

UNIT - III

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

UNIT – IV

Liquid State: Intermolecular forces, structure of liquids (a qualitative description). Structural differences between solids, liquids and gases. Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, Structure of nematic and cholestric phases.

UNIT – V

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 mean life. Determination of the order of reaction - differential method, method of integration, method of half life period and isolation method.

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NEW SYLLABUS

B. Sc. SEMESTER-II

PAPER-I INORGANIC CHEMISTRY

PC 22-2004

UNIT-I

Periodicity of p-Block Elements: Periodicity in properties of p-Block Elements with special reference to atomic and ionic radii, ionization energy, electron affinity, electronegativity, catenation (including diagonal relationship).

UNIT-II

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

UNIT-III

Some important compounds of p-Block Elements-II: Fluorocarbons, silicates (structural principle), tetra-sulphur tetranitride; Basic properties of halogens, interhalogens and polyhalides.

UNIT-IV

Chemistry of Noble Gases: Chemical properties of the Noble gases; Chemistry of xenon; Structure and bonding in xenon compounds.

UNIT-V

Nuclear Chemistry and Radiochemistry: Fundamental particles of nucleus (nucleons); Concept of nuclides and its representation; Isotopes, Isobars and Isotones (with specific examples); Forces operating between nucleons (n-n, p-p & n-p); Qualitative idea of stability of nucleus (n/p ratio). Natural and artificial radioactivity; Radioactive disintegration series; Radioactive displacement law; Radioactivity decay rates, half life and average life; Nuclear binding energy, mass defect and calculation of defect and binding energy; Nuclear reactions, Spallation, Nuclear fission and fusion.

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NEW SYLLABUS

B.Sc Semester II Chemistry Paper II P C 22-2005

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 chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic 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 alicyclic compound.

Conformational isomerism: Conformational analysis of ethane and n-butane, conformation of monosubstituted 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 and Kekulé structure. Stability and carbon-carbon bond

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lengths of benzene, resonance structure, MO picture.

Aromaticity: The Huckel huckel rule, aromatic ions.

UNIT – IV

Aromatic electrophilic substitution - 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 substituents, orientation and ortho/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

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NEW SYLLABUS

CHEMISTRY PRACTICAL B.Sc. PT-I

5 hrs. Duration

4 hrs./ week

Max. Marks: 100

Min. Marks: 36

INORGANIC CHEMISTRY

Qualitative Analysis

Semi-micro Analysis : Cation analysis, separation and identification of ions from Groups I, II, III, IV, V and VI. Anion analysis.

Volometric Analysis

1. Complexometric titrations (EDTA): estimation of Ca^{+2} and Mg^{+2} ions.
2. Iodometric/Iodimetric titrations.
3. Determination of total hardness of water.

ORGANIC CHEMISTRY

Laboratory techniques

Calibration of Thermometer

80-82* (Naphthalene), 113.5-114 (Acetanilide), 132.5-133* (Urea), 100* (Distilled Water)

Determination of Melting point Naphthalene 80-82*, Benzoic acid 121.5-122*
Urea 132-133*, Succinic acid 184.4-185*

Cubbanic acid 132.5-144*, m-Dinitrobenzene 90*

p-Dichlorobenzene 52*, Aspirin 135*

Determination of boiling point

Ethanol 78*, Cyclohexane 81.4*, Toluene 110.6*, Benzene 80*

Mixed melting point determination

Urea-Citramic acid mixture of various composition (1:4, 1:1, 4:1)

Distillation

Simple distillation of ethanol-water mixture using water

condenser distillation of nitrobenzene and aniline using air condenser.

Crystallization.

Concept of induction of crystallization.

Phthalic acid from hot water (using fluted filter paper and stemless funnel).

Acetanilide from boiling water.

Naphthalene from ethanol.

Benzoic acid from water.

Decolorisation and crystallization using charcoal

Decolorisation of brown of impure naphthalene (100 g of naphthalene mixed with 0.3

Congo Red using 1g decolorizing carbon) from ethanol.

Sublimation (Simple and vacuum)

Camphor, Naphthalene, Phthalic acid and succinic acid.

Qualitative Analysis

Detection of extra elements (N.S. and halogens) and functional groups (carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and anilide) in simple organic compounds.

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PHYSICAL CHEMISTRY

Distribution Law

1. To study the distribution of Iodine between water and CCl_4
2. To study the distribution of benzoic acid between benzene and water.

Viscosity, Surface Tension

1. To determine the percentage composition of a given mixture (non interacting systems) by viscosity method.
2. To determine the viscosity the excess viscosity of these solutions.

To determine the percentage composition of a given binary mixture by surface tension method (acetone & ethylmethyl ketone).

Chemical Kinetics

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed ions and room temperature.
2. To study the effect of acid strength on the hydrolysis of an ester.
3. To compare the strengths of HCl and H_2SO_4 by studying the kinetics of hydrolysis of ethylacetate.
4. To study kinetically the reaction rate of decomposition of iodide by H_2O_2 .

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STRUCTURE AND FUNCTION OF INVERTEBRATES - I

Scheme of examination:

MM: 35

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**TAXONOMY**

- Hierarchy, Binomial & Trinomial nomenclature, Rules of nomenclature, Concept of Five kingdom.
- Basis of Classification - Grade of organization, Symmetry, Coelom, Embryogeny, Segmentation.
- Classification of Invertebrate phyla upto class level.

UNIT - II**Phylum Protozoa:**

- Type study *Amoeba*, *Euglena*, *Paramecium* (Habit, Habitat & Salient features with particular reference to locomotion, nutrition and reproduction).
- Economic Importance of Protozoa.

UNIT – III**Phylum Porifera**

- Type study- *Sycon*
- Canal system of Sponges, Skeletal system,
- Economic Importance and larvae of porifera

UNIT – IV**Phylum Coelenterata**

- Type study – *Obelia*,
- Polymorphism
- Coral and Coral reefs
- Larvae of coelenterates

UNIT - V**Phylum Platyhelminthes**

- Type study- *Taenia* (External features and life cycle)

Phylum Nematelminthes

- *Ascaris* (External features and life cycle)
- Parasitic adaptations of Helminthes,
- Common Helminthes Diseases. Larval forms of helminthes.

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NEW SYLLABUS

B.Sc Semester I Zoology Paper II P C22-1014

CELL BIOLOGY

Scheme of examination:

MM: 35

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

- Principles & Applications of light and electron Microscopy.
- Cell- Diversity of cell size & shape
- Characteristics of Prokaryotic & Eukaryotic cells.
- Cell theory, Exceptions of cell theory: Virus.

UNIT - II

- Cell membrane – composition & ultrastructure
- Membrane models – Danielli & Davson, unit membrane, Fluid Mosaic model),
- Transport across cell membrane – Permeability, Passive and Active transport, Exocytosis, Endocytosis (Pinocytosis, Phagocytosis).

UNIT - III

Cell organelles: structure, composition & function-

- Endoplasmic reticulum, Golgi complex, Ribosome, Lysosomes
- Mitochondria: biogenesis, electron transport chain, generation of ATP molecules (Chemiosmotic hypothesis of Mitchelle)
- Peroxisomes, Microtubules & Centrioles, cilia & flagella

UNIT – IV

- **Nuclear Organization:** Ultrastructure of Nucleus - nuclear envelope, nuclear matrix and nucleolus,
- Chromosomes: Morphology and structure
- Special type of Chromosome - Polytene & Lampbrush
- Chromosomal Organization

UNIT - V

- **Cell Division** - Cell cycle (S, G1, G2, M phase)
- Mitosis: Phases & process of mitosis
- Meiosis: Phases & Process of meiosis
- Cancer- types, properties of cancer cell, carcinogens.

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NEW SYLLABUS

B.Sc Semester II Zoology Paper I P C 22-2013

STRUCTURE AND FUNCTION OF INVERTIBRATES - II

Scheme of examination:

MM: 35

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

Type study- Earthworm (Habit, Habitat, Salient features, structural organization)

- Metamerism
- Larval forms of annelida

UNIT - II

Type study- Prawn (Habit, Habitat, Salient features, structural organization)

- Larval forms of Arthropods
- Metamorphosis in insects
- Social organization in Termites & Honey bee.

UNIT III

Type study-Pila (Habit, Habitat, Salient features, structural organization)

- Larval forms of Mollusca
- Torsion

UNIT IV

Type study- Starfish (Habit, Habitat, Salient features, structural organization)

- Larval forms of Echinodermata
- Water vascular system

UNIT V

- Vermiculture
- Sericulture
- Apiculture
- Lac culture
- Prawn culture
- Pearl culture.

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NEW SYLLABUS

B.Sc

Semester II

Zoology

Paper II

P C 22-2014

MOLECULAR BIOLOGY AND GENETICS

Scheme of examination:

MM: 35

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

DNA structure (Watson & Crick's model), Polymorphism (A, B, Z type), Replication (Semiconservative mechanism), Replication forks (both Unidirectional & Bidirectional), Leading & lagging strand, Okazaki fragments. Experiments of Messelson & Stahl. Elementary idea about Polymerases, Topoisomerases, Single stranded binding protein, RNA Primer, DNA repair

UNIT II

- RNA- Structure & types,
- Genetic code,
- Protein synthesis – Transcription & Translation,
- Gene expression – Gene concept, gene regulation (lac operon).

UNIT III

Mendelism – I

- Mendel's work and laws.
- Interactions of Genes: Co-dominance and incomplete dominance, Complementary, Supplementary, Epistasis, Polymorphic genes.
- Multiple alleles- Inheritance of human blood group-(A, B, O) & Rh factor.

UNIT IV

Mendelism – II

- Chromosomal theory of inheritance.
- Linkage & linkage maps.
- Crossing over- Mechanism, theories, Cytological detection & significance
- Mutations- Chromosomal & Gene, mutagens. Cytoplasmic inheritance.

UNIT V

- Determination of Sex – Chromosomal mechanism, Genic Balance Theory, sexual function of X & Y chromosome, Non disjunction, Gynandromorphs. Sex linked inheritance in man. Y linked genes, Sex limited genes, Sex influenced genes,
- Human genetics – Human Chromosomes, Karyotype & Idiogram.
- Chromosomal abnormalities (Autosomes & Sex chromosomes),
- Genetics counseling, Eugenics & Euthenics.
- Genetic Disorders- Down's, Turner's, Klinefelter's syndromes, Color blindness, Hemophilia, Phenylketoneuria.

