

PUNJABI UNIVERSITY, PATIALA
(Established Under Punjab Act. No. 35 of 1961)

**ORDINANCES
AND
OUTLETS OF TESTS,
SYLLABUS AND COURSES OF READING
FOR B.SC. (CHEMISTRY) PART-I
SESSION 2020-21, 2021-22 & 2022-23**



PUNJABI UNIVERSITY, PATIALA
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B.Sc. (Chemistry) Part-I
2020-21, 2021-22 & 2022-23

SEMESTER I

Paper	Title	Max. Marks	Sem. Paper	Int. Asstt.
I	INORGANIC CHEMISTRY	35	26	09
II	ORGANIC CHEMISTRY	35	26	09
III	PHYSICAL CHEMISTRY	35	26	09
I	PRACTICAL CHEMISTRY	45	16 (Pass Marks)	

SEMESTER II

Paper	Title	Max. Marks	Sem. Paper	Int. Asstt.
I	INORGANIC CHEMISTRY	35	26	09
II	ORGANIC CHEMISTRY	35	26	09
III	PHYSICAL CHEMISTRY	35	26	09
II	PRACTICAL CHEMISTRY	45	16 (Pass Marks)	

Drug Abuse Problem, Management and Prevention* 100 (MM) 70 (SP) 30(IA)

Qualifying Paper: Session 2016-17, 2017-18 and 2018-19

*As per University Letter No.13831/SM-6 Dated: 12.10.2016

PAPER-I

INORGANIC CHEMISTRY

Max Marks : 35

Semester Paper : 26

Internal Assessment: 9

Pass Marks : 35%

30 hours

Time allowed - 3 hrs

3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

1. Atomic Structure

7 hrs

Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, significance of Ψ and Ψ^2 , quantum numbers, radial and angular wave functions and probability distribution curve, shapes of s, p, d orbitals. Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements and ions.

2. Periodic Properties

5 hrs.

Position of element in the periodic table effective nuclear charge and its calculations. Atomic and ionic radii, ionization energy, electronic affinity and electronegativity-definition, methods of determination or evaluation, trends in periodic table and applications in predicting and explaining the chemical behaviour.

3. Chemistry of Noble gases

3 hrs.

Chemical properties of the noble gases, chemistry of xenon, structure and bonding in xenon compounds.

Section - B

1. Chemical Bonding - I

15 hrs.

Covalent Bond-Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions. BeF_2 , BF_3 , CH_4 , PF_5 , SF_6 , IF_7 , SnCl_2 , XeF_4 , BF_4^- , PF_6^- , SnCl_6^{2-} .

2. Chemical Bonding - II

Valence shell electron pair repulsion (VSEPR) theory to NH_3 , H_3O^+ , SF_4 , ClF_3 , ICl_2 , and H_2O . MO theory, homonuclear (elements and ions of 1st and 2nd row), and heteronuclear (BO , CN , CO^+ , NO^+ , CO , CN), diatomic molecules, multicenter bonding in electron deficient molecule (Boranes) percentage ionic character from dipole moment and electronegativity difference.

SEMESTER I PAPER-II ORGANIC CHEMISTRY

Max Marks : 35

Semester Paper : 26

Internal Assessment: 9

Pass Marks : 35%

30 hours

Time allowed - 3 hrs

3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

I. Structure and Bonding

5 Hrs.

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, Van der Waals interactions, resonance, hyperconjugation, aromaticity, inductive and field effects, hydrogen bonding.

II. Mechanism of Organic Reactions

7 Hrs

Curved arrow notation, drawing electron movements with half-headed and double-headed arrows, homolytic and heterolytic bond breaking. Types of reagents of organic reaction. Energy considerations. Reactive intermediates—bocations, 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 effect, kinetic and stereo-chemical studies).

III. Alkanes

4 Hrs.

Isomerism in alkanes, sources, methods of formation (with special reference to Wurtz reaction, Kolbe reaction, Corey-House reaction and decarboxylation of carboxylic acids), physical properties and Mechanism of free radical halogenation of alkanes: orientation, reactivity and selectivity.

Section – B

1. Cyclo alkanes

3 Hrs.

Cycloalkanes—nomenclature, chemical reactions, Baeyer's strain theory and its limitations. Ring strain in small rings (cyclopropane and cyclobutane), theory of strain less rings. The case of cyclopropane ring: banana bonds.

2. Alkenes, Cycloalkenes

6 Hrs.

Nomenclature of alkenes—methods of formation, mechanisms and 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 and the allylic and vinylic positions of alkenes. Industrial application of ethylene and propene.

Methods of formation, conformation and chemical reactions of Cycloalkenes.

3. Dienes And Alkynes

6 Hrs.

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

Nomenclature, structure and bonding in alkynes. Methods of formation. Chemical reactions of alkynes, acidity of alkynes. Mechanism of electrophilic and nucleophilic addition reactions hydroboration-oxidation. metal-ammonia reductions, oxidation and polymerization.

**SEMESTER I
PAPER-III
PHYSICAL CHEMISTRY**

Max Marks : 35
Semester Paper : 26
Internal Assessment: 9
Pass Marks : 35%

30 hours
Time allowed - 3 hrs
3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

1. Mathematical Concepts

8 Hrs.

Logarithmic relations. curve sketching, linear graphs and calculation of slopes, differentiation of functions like kx , e^x , x^n , $\sin x$, $\log x$, maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions permutations and combinations. Factorials. Probability .

2. Evaluation of Analytical Data

6 Hrs.

Terms of mean and median, precision and accuracy in chemical analysis, determining accuracy of methods, improving accuracy of analysis, data treatment for series involving relatively few measurements, linear least squares curve fitting, types of errors, standard deviation, confidence limits, rejection of measurements (F-test and Q-test) numerical problems related to evaluation of analytical data.

Section - B

3. Liquid State

4 Hrs.

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 eholestric phases. Thermography and seven segment cell.

4. Gaseous State

8 Hrs

Postulates of kinetic theory of gases, deviation from ideal behaviour, van der Waals equation of states, the isotherms of van der Waals equation, relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of state.

Molecular velocities: Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision

number, mean free path and collision diameter, Liquifacation of gases (based on Joule-Thomson effect).

5. Physical Properties and Molecular Structure 4 Hrs.

Optical activity, polarization-(Clausius-Mossotti equation), orientation of dipoles in an electric field, dipole moment. Induced dipole moment, measurement of dipole moment temperature method and refractivity method. Dipole moment and structure of molecules, magnetic properties-paramagnetism, diamagnetism and ferromagnetism.

**PRACTICAL CHEMISTRY - I
SEMESTER I**

Max Marks : 45

6 Periods / week

Passing Marks : 35%

**INSTRUCTIONS FOR THE
PAPER SETTERS EXAMINERS/CANDIDATES**

The Practical Examinations will be held in morning (one day) and morning session will be of 3 hours duration. During this session students will perform semi micro analysis. Paper setter will enlist five different mixtures and the examiner will randomly distribute these mixtures amongst the students. Each candidate will analyse one mixture. Students are permitted to consult the books for the scheme of tests for semimicro analysis. Examiners will check the note books and will hold viva-voce.

INORGANIC CHEMISTRY

Semi-micro analysis:

Cation analysis, separation and identification of ions from Groups I, II, III, IV, V and VI. Anion analysis (2 cation and 2 anion with no interference). 30 Marks

Viva Voce 10 Marks

Copy 5 Marks

**SEMESTER II
PAPER-I
INORGANIC CHEMISTRY**

Max Marks : 35
Semester Paper : 26
Internal Assessment: 9
Pass Marks : 35%

30 hours
Time allowed - 3 hrs
3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

1. Ionic Solids-

5 hrs.

Concept of close packing, Ionic structures, (NaCl type, Zinc blende, Wurzite, CaF₂, and antiferite), radius ratio rule 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. Metallic bond-free electron, valence bond and bond theories.

2. s-Block Elements

5 hrs.

Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems.

3. p - Block Elements (Group 13)

5 hrs.

Comparative study (including diagonal relationship) of groups 13 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13; hydrides of boron-diborane and higher boranes, borazine, borohydrides.

Section - B

4. p - Block Elements (Group 14-17)

15 hrs.

Comparative study (including diagonal relationship) of groups 14-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 14-17; fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens and polyhalides.

**SEMESTER II
PAPER-II
ORGANIC CHEMISTRY**

Max Marks : 35
Semester Paper : 26
Internal Assessment: 9
Pass Marks : 35%

30 hours
Time allowed - 3 hrs
3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

1. Stereochemistry of Organic Compounds

15 Hrs.

Concept of isomerism. Types 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.

Geometric isomerism-determination of configuration of geometric isomers, E & Z system of nomenclature, geometric isomerism in oximes and alicyclic compounds.

Conformational isomerism-conformational analysis of ethane and n-butane; conformations of cyclohexane, axial and equatorial bonds, conformation of mono substituted cyclohexane derivatives.

Newman projection and Sawhorse formulae, Fischer and flying wedge formulae.

Difference between configuration and conformation.

Section - B

1. Aromaticity and Aromaticity

7 Hrs.

Nomenclature of benzene derivatives. Aromatic nucleus and side chain. Structure of benzene: molecular formula and Kekule structure. Stability and carbon-carbon bond lengths of benzene, resonance structure, MO picture.

Aromaticity: the Huckel rule, aromatic ions.

Aromatic electrophilic substitution-general pattern of the mechanism, role of σ and π 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 benzene derivatives.

Methods of formation and chemical reaction of alkylbenzenes alkynyl benzenes.

2. Alkyl and aryl halides

8 Hrs.

Nomenclature and classes of alkyl halides, methods of formation chemical reactions. Mechanisms of nucleophilic substitution reactions of alkyl halides, S_N^1 and S_N^2 reactions with energy profile diagrams.

Methods of formation of aryl halides, nuclear and side chain reactions. The addition elimination and the elimination-addition mechanisms of nucleophilic aromatic substitution reactions.

Relative reactivities of alkyl halides vs allyl, vinyl and aryl halides.

SEMESTER II PAPER-III PHYSICAL CHEMISTRY

Max Marks : 35

Semester Paper : 26

Internal Assessment: 9

Pass Marks : 35%

30 hours

Time allowed - 3 hrs

3 period/week

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B and C. Sections A and B will have four questions each from the respective section of the syllabus and will carry 4 marks each. Section C will consist of 5 short answer questions that will cover the entire syllabus and will be of 2 marks each. Use of scientific non-programmable calculator is allowed.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions (Section C 9th question being compulsory) selecting two questions from each of A & B Sections.

Section - A

1. Solutions, Dilute Solutions and Colligative Properties

8 Hrs.

Ideal and non-ideal solutions, methods of expressing concentration of solutions, activity and activity coefficients.

Dilute solution, colligative properties, Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis, law of osmotic pressure and its measurement, determination molecular weight from osmotic pressure,

Elevation of boiling point and depression of freezing point, Thermodynamic derivation of relation between molecular weight and elevation in boiling point and depression in freezing point. Experimental methods for determining various colligative properties.

Abnormal molar mass, degree of dissociation and association of solutes.

2. Colloidal State 7 Hrs.

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 liquids (emulsions) types of emulsions, preparation, Emulsifiers.

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

Section – B

3. Chemical Kinetics and catalysis 15 Hrs.

Chemical kinetics and its scope, rate of a reaction, factors influencing the rate of a reaction- concentration, temperature, pressure, solvent, light, catalyst. 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-s-differential method, method of integration, method of half life period and isolation method.

Radioactive decay as a first order phenomenon.

Theories of chemical kinetics, effect of temperature on rate of reaction. Arrhenius equation, concept of activation energy.

Simple collision theory based on hard sphere model, transition state theory (equilibrium hypothesis). Expression for the rate constant based on equilibrium constant and thermodynamic aspects.

Catalysis and general characteristics of catalytic reactions. Homogeneous catalysis, acid base catalysis and enzyme catalysis including their mechanisms, Michaelis Menten equation for enzyme catalysis and its mechanism.

**PRACTICAL CHEMISTRY II
SEMESTER II**

Max Marks : 45

6 Periods / week

Passing Marks : 35%

**INSTRUCTIONS FOR THE
PAPER SETTERS EXAMINERS/CANDIDATES**

In this session in morning students will perform physical and organic chemistry practicals. Examiner will again conduct viva-voce of students.

- 1) The examiner should preferably give different liquids solids to the candidates for the determination of boiling point/melting point and crystallization from the list of liquids/solids by the paper setter.
- 2) The paper setter will provide a list of five physical chemistry experiments. The examiner will allot one experiment randomly to each candidate. The candidate will write theory, brief procedure and

general calculations of the experiment in the first 10 minutes and thereafter perform the actual experiment.

DETAILS OF DISTRIBUTION OF MARKS

1) Melting point/boiling point/crystallization	10 marks
2) Physical chemistry experiment	20 marks
a) Initial write up	7 marks
b) Performance	18 marks
4) Viva-voce	10 marks
5) Note Book	5 marks

Laboratory Techniques

Determination of melting points:

Naphthalene, 80-82°. Benzoic acid, 121.5-122°
Urea, 132.5-133°, Succinic acid, 184.5-185°.
Cinnamic acid, 132.5-133°, Salicylic acid, 157.5-158°.
Acetanilide, 113.5-114°, *m*-Dinitrobenzene, 90°.
p-Dichlorobenzene, 52°, Aspirin, 135°.

Determination of boiling points

Ethanol, 78°, Cyclohexane, 81.4°. Toluene, 110.6°, Benzene, 80°.

Crystallization

Concept of induction of crystallization
Phthalic acid from hot water (using fluted filter paper and seamless funnel)
Acetanilide from boiling water
Naphthalene from ethanol
Benzoic acid from water

Physical Chemistry Experiment

20 Marks

Chemical Kinetics

1. To determine the specific reaction rate of the hydrolysis of methyl acetate/ethyl acetate catalyzed by hydrogen ions at room temperature.
2. To study the effect of acid strength on the hydrolysis of an ester.
3. Viscosity & Surface Tension of pure liquids.
To determine the viscosity and surface tension of C₂H₅OH and glycerin solution in water
4. Molecular weight determined by Rast method.

Viva Voce

10 Marks

Copy

5 Marks

BOOKS SUGGESTED (THEORY COURSES)

1. *Basic Inorganic Chemistry*. F.A. Cotton. G. Wilkinson and P.L. Gaus. Wiley.
2. *Concise Inorganic Chemistry*. J. D. Lee. ELBS.

3. *Concepts of Models of Inorganic Chemistry*. B. Doaglas. D. McDaniel and I. Alexander, John Wiley.
4. *Inorganic Chemistry*. D.E. Shriver, P. W. Aikins and C.H. Langford. <Oxford.
5. *Inorganic Chemistry*. W. W. Porterfield Addison. Wesley.
6. *Inorganic Chemistry*. A.G. Sharpe, ELBS.
7. *Inorganic Chemistry*. G.L. Miessler and O.A. Tarr, Prentice Hall.
8. *Organic Chemistry*. Morrison and Boyd, Prentice Hall.
9. *Organic Chemistry*. L.G. Wade Jr. Prentice Hall.
10. *Fundamentals of Organic Chemistry*. Solomons, John Wiley.
11. *Organic Chemistry*. Vol. I, II & III. S.M. Mukherji, S.P. Singh and R.P. Kapoor, Wiley Eastern Ltd. (New Age International)
12. *Organic Chemistry*. F.A. Aarey, McGraw Hill India.
13. *Introduction to Organic Chemistry*. Stretwieser, Heathcock and Kosover, Machmilan.
14. *Physical Chemistry*. G.M. Barrow, International Student Edition. McGraw Hill.
15. *Basic Programming with Application*. V.K. Jain, 1'ata McGraw Hill.
16. *Computers and Common. Sense*. B. Ryal and Shely, Prentice Hall.
17. *University General Chemistry*. C.N.B. Rao. Macmillan.
18. *Physical Chemistry*. R.A. Alberty, Wiley Eastern Ltd.
19. *The Elements of Physical Chemistry*, P.w. Aikins, Oxford.
20. *Physical Chemistry Through Problems*. S.K. Dogra and S. Dogra. Wiley Eastern Ltd.

BOOKS SUGGESTED (LABORATORY COURSES)

1. *Vogel's Qualitative Inorganic Analysis*, revised, Svehla, Orient Longman.
2. *Vogel's Textbook of Quantitative Inorganic Analysis* (revised), J. Basseff, R.C. Dennery, G.H. Jeffery and J. Mendham, ELBS.
3. *Standard Methods of Chemical Analysis*, W.w. Scott the Technical Press.
4. *Experimental Inorganic Chemistry*: W.G. Palmer, Cambridge.
5. *Handbook of Preparative Inorganic Chemistry*. Vol. I & II, Brauer, Academic Press.
6. *Inorganic Synthesis*, McGraw Hill.
7. *Experimental Organic Chemistry*. Vol. I & II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
8. *Laboratory Manual in Organic Chemistry*. R.K. Bansal, Wiley Eastern.'
9. *Vogel's Textbook of Practical Organic Chemistry*. B.S. Furniss, A.I. Harnaford, V. ogers, P.w.G. Smith and A.R. Tatchell, ELBS. -.
10. *Experiments in General Chemistry*. C.N.R. Rao and U.e. Aggarwal. East- West Press.
11. *Experiments in Physical Chemistry*. R.C. Dass and B. Behra, Tata McGraw Hill.
12. *Advanced Practical Physical Chemistry*, J.B. Yadav, Goel Publishing House.
13. *Advanced Experimental Chemistry*. Vol. I: Physical, J.N. Gurtu and R. Kapoor, S. Chand & CO.
14. *Selected Experiments in Physical Chemistry*, N.G. Mukherjee, J.N. Ghose & Sons.
15. *Experiments in Physical Chemistry*. J.E. Ghosh, Bharati Bhavan.

SYLLABUS OF

B.A./B.Sc. Part-I (COMPUTER SCIENCE)
(Semester Ist & IInd)
(2020-21, 2021-22 and 2022-23 Sessions)



PUNJABI UNIVERSITY PATIALA
(Established under Punjab Act no. 35 of 1961)

B.A./B.Sc. Part-I (COMPUTER SCIENCE)
(Semester I)
(2020-21, 2021-22 and 2022-23 Sessions)

PAPER BAP-101: FUNDAMENTALS OF INFORMATION TECHNOLOGY

For Regular Students

External Marks: 45

Minimum Pass Marks: 35%

Internal Assessment: 15

For Distance Education Students

External Marks:60

Minimum Pass Marks:35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55

A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 40% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers. Categories of Computers - Supercomputer, mainframe computer, network server, Workstation, Desktop computers, notebook computer, Tablet PC, handheld PC, smart phone.

Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Impact Printers - Dot matrix, Character and Line printer, Non Impact Printers – DeskJet and Laser printers, Plotter.

Memories: Memory Hierarchy, Primary Memory – RAM, ROM, Cache memory. Secondary Storage Devices - Hard Disk, Compact Disk, DVD, Flash memory.

Software: Types of Software- System Software, Application Software, Firmware. Type of System Software: Operating Systems, Language Translators, Utility Programs, Communications Software.

Commonly Used Application Software: Word Processor, Spreadsheet, Database, Education, Entertainment Software.

Computer Languages: Machine language, assembly language, high level language, 4GL.

SECTION B

Number System: Non-positional and positional number systems, Base conversion, Concept of Bit and Byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other. Binary Arithmetic: Addition, subtraction and multiplication, 1's complement, 2's complement, subtraction using 1's complement and 2's complement.

Computer Codes: weighted and non-weighted code, BCD, EBCDIC, ASCII, Unicode.

Computer Network: Network types, network topologies.

Internet Related Concepts: Internet, World Wide Web, Hypertext, Uniform Resource Locator, Web

Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Web Search Engine, Net Surfing, web portal, Wiki, Blog.

Advanced Trends in IT : Mobile Internet, GPS, 3G, 4G, Wi-Fi, Bluetooth, Cloud Technology, Virtual LAN Technology, Firewall, E-Commerce, M-Commerce, Nanotechnology, Virtual Reality, BPO and KPO, Online shopping, Social Media - YouTube, FaceBook, LinkedIn, Twitter, Google+.

Applications of IT: IT in Business and Industry, IT in Education & training, IT in Science and Technology, IT and Entertainment, Current Trends in IT Application - AI, Virtual Reports, voice recognition, Robots, Multimedia Technology.

Reference Books:

1. Peter Nortorn, Introduction to Computers, Seventh Edition
2. V. Rajaraman, Fundamentals of Computers, PHI.
3. Larry E. Long and Nancy Long, Computers: Information Technology in Perspective, PHI.
4. N. Subramanian, Introduction to Computers, Tata McGraw-Hill.
5. D.H. Sanders, Computers Today, McGraw- Hill.

PAPER BAP-102: PRACTICAL BASED ON PAPER BAP-101

Maximum Marks: 40

Maximum Time: 3 Hrs.

Minimum Pass Marks: 35%

Practical Units to be conducted: 45-55 Hrs

The laboratory course will comprise of Activities related to Windows and exercise to what is learnt under Paper BAP-101 such as:

Windows

Activity 1: Windows 7 Installation and Software & Drivers installation.

Activity 2: Basic components of Window-Desktop, Icons, Taskbar, Status Bar, Wallpapers, Screen Saver

Activity 3: Start Menu: Accessories- Notepad, Calculator, Clock, Date and Time, Disk Defragmentation, Working with Control Panel.

Activity 4: Taskbar properties - Maximize Minimize, Restore, and Close.

Activity 5: Creating Files, Folders, Shortcuts, Moving folders (right click options)

Internet

Activity 1: Connecting through Wi-fi, Blue tooth and Hot Spot.

Activity 2: Web Surfing, searching contents through Search Engines.

Activity 3: Creating and maintaining Web Blogs and Web portals

Social Media

Activity 1: Creating account, linking accounts, setting profiles and preferences.

Activity 2: Posting messages, replying, forwarding, tagging contents.

Activity 3: Online shopping, comparing prices etc.

Activity 4: Creating and maintaining social profiles at LinkedIn, FaceBook, Twitter etc.

The breakup of marks for the practical will be as under:

Lab Record	:	05 Marks
Viva Voce	:	10 Marks
Program Development And Execution	:	25 Marks

B.A./B.Sc. Part-I (COMPUTER SCIENCE)
(Semester II)
(2020-21, 2021-22 and 2022-23 Sessions)

PAPER BAP-103 : MS-OFFICE AUTOMATION TOOLS

For Regular Students

External Marks: 45

Minimum Pass Marks: 35%

Internal Assessment: 15

For Distance Education Students

External Marks:60

Minimum Pass Marks:35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55

A) Instructions for paper-setter

The question paper will consist of three sections A, B & C. Sections A & B will have four questions from the respective sections of the syllabus and will carry 40% marks each. Section C will have 6-12 short answer type questions which will cover the entire syllabus uniformly and will carry 20% marks in all.

B) Instructions for candidates

1. Candidates are required to attempt two questions each from sections A & B of the question paper and the entire section C.
2. Use of non-programmable scientific calculator is allowed.

SECTION A

MS-OFFICE: Basic layout, components, Office Characteristics, Common Office Controls and shortcuts for Home, Insert, Page Layout, Mailing, Review and View

MS Word 2010: Introduction to Word Processing, Toolbars, Ruler, Menus, Keyboard Shortcut. Previewing documents, Printing documents, Formatting documents, Checking the grammar and spelling, Formatting via find and replace, Using the Thesaurus, using Auto Correct, word count, Hyphenating, Mail merge, mailing Labels Wizards and Templates, Handling Graphics, tables as Converting a word document into various formats.

MS PowerPoint 2010: Introduction, Elements of Power Point Package, Starting and exploring Power Point menus (Insert, Format, Tools, Slide Show, Window, Help options and all of their features, Options and sub options etc.), Creating, inserting, deleting and formatting slides, Formatting and enhancing text, Slides with graphs, Giving Animation to slides, Transfer of files between Power Point and other word processors and software packages.

SECTION B

MS-EXCEL 2010: Creating worksheet, entering data into worksheet, Entering data into worksheet, Entering, data, dates, alphanumeric, values, saving & quitting worksheet, Opening and moving and existing worksheet, Toolbars and Menus, keyboard shortcut. Working with single and multiple workbooks, working with formulation & cell referencing, formatting of worksheet.

MS-ACCESS 2010: Introduction to MS-ACCESS-2010 working with databases and tables, queries in Access. Introduction to forms, sorting and filtering, controls. Creating reports, Using Macro

Reference Books:

1. Rob Tindrow, Jim Boyce, Jeffrey R. Shapiro, Windows 10 Bible, Wiley.

PAPER BAP-104: PRACTICAL BASED ON PAPER BAP-103

Maximum Marks: 40

Maximum Time: 3 Hrs.

Minimum Pass Marks: 35%

Practical Units to be conducted: 45-55 Hrs

The laboratory course will comprise of Activities related to MS-OFFICE and exercise to what is learnt under Paper BAP-103 such as:

MS-Word

Activity 1:

- i. Create, open, save and close a document.
- ii. Typing, copying, moving and deleting data in word document.
- iii. Perform Save and Save as, Cut and Copy, Paste and Paste Special.

Activity 2:

Formatting of data in word Document:-

- i. Text formatting (font size, font style, font color, subscript, superscript, upper/lower case etc.)
- ii. Text Alignment and character spacing
- iii. Indention and line spacing
- iv. Border and shading
- v. Bullets and Numbering

Activity 3:

- i. Find and replace and data sorting in a document.
- ii. Protect your document.
- iii. Add chart in word document. Create different types of Charts in word.
- iv. Set a size, margin, orientation of page, Hyphenation, Columns and Line Numbers in MS-Word.

Activity 4:

- i. Set Page Color, Page Border, Themes, and Watermarks in MS-Word
- ii. Adding Tables, header/footers, pictures, page numbers and special symbols, Text Box in your word document.
- iii. Showing Ruler, Gridlines, Document Map, Thumbnails, Inserting Word Art, Drop Cap, Hyperlink, Equation etc. in word document

Activity 5:

- i. Arranging, splitting windows in MS-word
- ii. Perform Mail-merge in MS-word
- iii. Create and run Macros in MS-Word
- iv. Set the print properties of a word document

PowerPoint

Activity 1:

- i. Create, open, save and close a Presentation
- ii. Typing, copying, moving and deleting data in presentation.
- iii. New Slide, understanding Slide Layout, adding and deleting slides.

Activity 2:

Formatting of data in slides:-

- i. Text formatting (font size, font style, font color, subscript, superscript, upper/lower case etc.)

- ii. Text Alignment and character spacing
- iii. Indention and line spacing
- iv. Border and shading
- v. Bullets and Numbering

Activity 3:

- i. Set a size, margin, orientation of slides in PowerPoint.
- ii. Adding Tables, header/footers, pictures, page numbers and special symbols, Text Box etc. in your presentation

Activity 4:

- i. Adding Animation and Transition Effects in Slides, Understanding Slide Show
- ii. Presentation Views, Understanding Formatting commands in PowerPoint

Activity 5:

- i. Create and run Macros in PowerPoint
- ii. Arranging, splitting windows in MS-PowerPoint.

MS-Excel

Activity 1:

- i. Create, open, save and close workbook?
- ii. Create a new worksheet, renaming and moving sheet.
- iii. Entering, copying, moving and deleting data in cells and worksheets.
- iv. Insert and delete cells, columns and rows in MS-Excel.

Activity 2:

- i. Formatting of data in cells:-
- ii. Text formatting (font size, font style, font color, Cell border etc.)
- iii. Text Alignment
- iv. Text Orientation, Text Direction, Text Control.

Activity 3:

- i. Find and replace data in a sheet
- ii. Perform data sorting and data filtering in MS-Excel
- iii. Protect your Worksheet and Workbook?
- iv. Enter and perform some basic formulas in ms-excel.

Activity 4:

- i. Perform some basic Functions in MS-Excel.
- ii. Create a chart in MS-Excel.
- iii. Create different types of Charts in excel.
- iv. Set a size, margin, orientation of page in Ms-Excel.
- v. The print properties of worksheet in MS-Excel.

Activity 5:

- i. Hide and unhide row and column in MS-Excel
- ii. Set column width and row height in MS-Excel.
- iii. Adding text Box, header/footers, pictures and special symbols in your worksheet.
- iv. Arranging, splitting and hiding windows in MS-Excel. And also freezing panes.
- v. Create and run Macros in MS-Excel.

MS-Access 2010

Activity 1:

- i. Creating with databases and tables
- ii. Linking various Tables

- iii. Queries in Access

Activity 2:

- i. Creating forms
- ii. Filling information in forms
- iii. Saving forms

Activity 3:

- i. Sorting data
- ii. Filtering Data

Activity 4:

- i. Creating reports,
- ii. Using Macro

The breakup of marks for the practical will be as under:

Lab Record	:	05 Marks
Viva Voce	:	10 Marks
Practical Work	:	25 Marks

B.Sc. (Physics) Part-I (Ist and Second Semester)

SCHEME

SESSION 2020-21, 2021-22, 2022-23

Code	Title of Paper	No of Lectures	Max Marks			Examination Time (Hours)
			Total	Ext.	Int.	
SEMESTER -I						
Paper A	Mechanics-I	40	40	30	10	03 HRS.
Paper B	Vibrations and Waves-I	40	40	30	10	03 HRS.
Paper C	Electricity and Magnetism-I	40	40	30	10	03 HRS.
	Practicals	80	30	22	08	03 HRS.
SEMESTER -II						
Paper A	Mechanics-II	40	40	30	10	03 HRS.
Paper B	Vibrations and Waves-II	40	40	30	10	03 HRS.
Paper C	Electricity and Magnetism-II	40	40	30	10	03 HRS.
	Practicals	80	30	22	08	03 HRS.

General Instructions

- 1) There will be three papers of theory and one laboratory (practical) course.
- 2) The number of lectures per week will be three for each theory paper.
- 3) The number of lectures per week will be six for practicals.
- 4) The examination time for each theory will be 3 hours.
- 5) The examination time for practical will also be 3 hours.
- 6) The use of non programmable calculator will be allowed in the examination centre but this will not be provided by the University/College.
- 7) Each theory paper will consist of three sections A,B and C . Section C is compulsory
- 8) Use of scientific non programmable calculator is allowed in practicals also.

SECTION A

There will be four questions. Each question will carry five marks. Two questions are to be attempted

SECTION B

There will be four questions. Each question will carry five marks. Two questions are to be attempted.

SECTION C

There will be seven questions of short answer type covering the whole syllabi. Each question will carry two marks. Any five question to be attempted.

Semester -I

PAPER A: MECHANICS-I

Maximum Marks :	External	30
	Internal	10
	Total	40

Time Allowed: 3 Hours
Total Teaching hours: 40
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Cartesian and spherical polar co-ordinate systems, area, volume, displacement, velocity and acceleration in these systems, Solid angle, Various forces in Nature (brief introduction), Centre of mass, Equivalent one body problem, Central forces, Equation of motion under central force, Equation of orbit in inverse square, Force field and turning points, Kepler laws and their derivations.

SECTION B

Relationship of conservation laws and symmetries of space and time. Inertial frame of reference. Galilean transformation and invariance, Non-inertial frames of reference, Coriolis force and its applications. Variation of acceleration due to gravity with latitude. Foucault pendulum (qualitative). Elastic collision in Laboratory and C.M.system, velocities, angles and energies, Cross section of elastic scattering . Rutherford scattering (qualitative).

Text Books:

1. Mechanics : Berkeley Physics Course, vol. I by C.Kittel, W.D.Knight and M.A.Ruderman, Mc Graw-Hill Publication
2. Mechanics : H.S.Hans and S.P.Puri, Tata McGraw Hill, New Delhi

Semester –I

PAPER B: VIBRATIONS AND WAVES-I

Maximum Marks : External 30
Internal 10
Total 40

Time Allowed: 3 Hours
Total Teaching hours: 40
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and Consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Simple harmonic motion, energy of a Simple Harmonic Oscillation (SHO). Compound pendulum, Electrical oscillations. Transverse vibrations of a mass on a string, composition of two perpendicular SHM of same period and of period ratio 1 : 2. Anharmonic oscillations. Decay of free vibrations due to damping. Differential equation of motion, types of damping. Determination of damping co-efficient-logarithmic decrement, relaxation time and Q-Factor. Electromagnetic damping (Electrical oscillator).

SECTION B

Differential equation for forced mechanical and electrical oscillators. Transient and steady state oscillation. Displacement and velocity variation with driving force frequency, variation of phase with frequency resonance, Power supplied to an oscillator and its variation with frequency, Q value of a forced oscillator and band width. Q-value as an amplification factor of low frequency response.

Text Books:

1. Physics of Vibrations and Waves by H.J.Pain, Wiley & Sons, New Delhi
2. Fundamentals of Vibrations and Waves by S.P.Puri, Tata McGraw Hill, New Delhi.
3. Waves and Oscillations, by E.Crawford, Berkeley Physics Course, McGraw-Hill Publications.

Semester-I

PAPER C: ELECTRICITY AND MAGNETISM-I

Maximum Marks: External 30
Internal 10
Total 40

Time Allowed: 3 Hours
Total Teaching hours: 40
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Basic ideas of Vector Calculus, Gradient, Divergence, curl and their physical significance, Laplacian in rectangular. Coulomb's Law for point charges and continuous distribution of charges. Electric field due to dipole line charge and sheet of charge. Electric flux. Gauss's Law and its applications. Gauss's divergence theorem and differential form of Gauss's Law. Green's's theorem.

SECTION B

Work and potential difference. Potential difference as line integral of electric field. Electric potential due to a point charge, a group or point charges, dipole and quadruple moments, long uniformly charged wire, charged disc. Stoke's theorem and its application in Electrostatic field, $\text{curl } \mathbf{E} = 0$. Electric field as gradient of scalar potential. Calculation of E due to a point charge and dipole from potential. Potential due to arbitrary charge distribution and multipole moments. Poisson and Laplace's Equation and their solutions in Cartesian and concept of electrical images. Calculation of electric potential and field due to a point charge placed near an infinitely conducting sheet.

Text Books:

1. Fundamentals of Electricity and Magnetism by Author F.Kipp.
2. Electricity and Magnetism. Berkeley Physics Course. Vol. II by E.M Purcell, McGraw-Hill, 1965.
3. Introduction to classical Electrodynamics by David Griffith.
4. EM waves and Radiating systems by Edward C. Jordan and K.G Balmain.

B.Sc. (Physics)

General Guidelines for Physics Practical Examination

Maximum Marks :	External	22
	Internal	08
	Total	30

1. The student will be asked to perform one experiment out of the experiments mentioned in syllabus.
2. The distribution of marks is as follows :
 - (i) One full experiment requiring the student to take some data, analyse it and draw conclusions-(candidates are expected to state their results with limits of error. (10)
 - (ii) Brief theory (04)
 - (iii) Viva-Voce (04)
 - (iv) Record(Practical File) (04)
3. There will be one session of 03 hours duration. The paper will consist of 06 experiments out of which an examinee will mark 04 experiments and one of these is to be allotted by the external examiner.
4. Number of candidates in a group for practical examination should not exceed 12.
5. In a single group no experiment be allotted to more than three students in any group.
6. The student should determined Standard Deviations and probable error in the calculations whereas needed.

Semester- I

(75 Hours)

1. Analysis of experimental data by :
 - i) Fitting of given data to a straight line.
 - ii) Calculation of probable error.
2. To establish relationship between torque and angular acceteration using fly wheel and hence to find inertia of flywheel.
3. To determine the Young's Modulus by bending of beam.
4. To study one-dimensional collision using two hanging spheres of different materials.
5. Determination of Poisson's ratio for rubber.
6. Study the dependance of moment of inertia on distribution of mass (by noting time periods of oscillations) using objects of various geometrical shapes but of same mass.
7. To set up CRO for Sine and Square wave and to find their frequency and amplitude.
8. Study the depedence of solenoidal field on number of turns and current.
9. To study the magnetic field produced by a current carrying solenoid using a search coil and to find the value of permeability of air.
10. To determine the value of air capacitance by de-Sauty method and to find the permitivity of air and also to determine the dielectric constant of medium.
11. To study the efficiency of an electric kettle/heater element with varying input voltages.
12. To study the working of energy meter.

Text and Reference Books:

1. B.Sc. Practical Physics, By C.L.Arora, S.Chand & Co.
2. A Laboratory Manual of Physics for undergraduate classes by D.P.Khandelwal

Semester –II

PAPER A: MECHANICS-II

Maximum Marks :	External	30
	Internal	10
	Total	40

Time Allowed: 3 Hours
Total Teaching hours: 40
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C . Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Rigid body motion: Rotational motion, principal moments and axes. Euler's equations; precession and elementary gyroscope. Galilean transformation and Invariance, Non-Inertial frames, concept of stationary universal frame of reference and ether. Michelson-Morley experiment and its result.

SECTION B

Postulates of special theory of relativity. Lorentz transformations, Observer and viewer in relativity. Relativity of simultaneity. Length, Time, Velocities, Relativistic Doppler effect. Variation of mass with velocity, mass-energy equivalence, rest mass in an inelastic collision, Relativistic momentum and energy, their transformation, concepts of Minkowski space, four vector formulation.

Text Books:

1. Mechanics : Berkeley Physics Course, vol. I by C.Kittel, W.D.Knight and M.A.Ruderman, Mc Graw-Hill Publication
2. Mechanics : H.S.Hans and S.P.Puri, Tata Mc Graw Hill Publication, New Delhi

Semester -II

PAPER B: VIBRATIONS AND WAVES-II

Maximum Marks : External 30
Internal 10
Total 40

Time Allowed: 3 Hours
Total Teaching hours: 40
Pass Marks: 35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Stiffness coupled oscillators. Normal co-ordinates and normal modes of vibration. Inductance coupling of electrical oscillators, Types of waves, Wave equation (transverse) and its solution, The string as a forced oscillator, Characteristic impedance of a string. Impedance matching. Reflection and transmission of energy, Reflection and Transmission Energy, Reflection and transmission of string, wave and group velocity. Standing waves on a string of fixed length. Energy of vibrating energy string, wave and group velocity.

SECTION B

Physical interpretation of Maxwell's equations. Electromagnetic waves and wave equation in a medium having finite permeability and permittivity but with conductivity $\sigma=0$. Poynting vector. Impedance of a dielectric to EM waves, EM waves in a conducting medium and skin depth. EM waves velocity in a conductor an anomalous dispersion. Response of a conducting medium of EM waves. Reflection and transmission of EM waves at a boundary of two dielectric media for normal incidence. Reflection of EM waves from the surface of a conductor at normal incidence.

Text Books:

1. Fundamentals of Vibrations and Waves by S.P.Puri, Tata McGraw Hill, New Delhi.
2. Physics of Vibrations and Waves by H.J.Pain, Wiley & Sons, New Delhi
3. Waves and Oscillations, by E.Crawford, Berkeley Physics Course, McGraw-Hill Publications, New Delhi.
4. EM Waves and Radiating Systems by Edward C.Jordan and K.G.Balmain, Prentice Hall of India, New Delhi.

Semester-II

PAPER C: ELECTRICITY AND MAGNETISM-II

Maximum Marks:	External	30
	Internal	10
	Total	40

Time Allowed:	3 Hours
Total Teaching hours:	40
Pass Marks:	35 %

Out of 40 Marks, internal assessment (based on two mid-semester tests/ internal examination, written assignment/project work etc. and attendance) carries 10 marks, and the final examination at the end of the semester carries 30 marks.

Instruction for the Paper Setter

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from respective sections of the syllabus. Section C will have 07 short answer type questions (Candidate is to attempt any five questions), which will cover the entire syllabus uniformly. Each question of sections A and B carry 05 marks. Section C will carry 10 marks of 2 marks each.

Instruction for the candidates

- 1) Candidates are required to attempt two questions each from section A and B, and the entire section C is compulsory and consist of seven questions (Candidate is to attempt any five questions).
- 2) Use of non programmable calculator is allowed in the examination centre but this will not be provided by the University/College.

SECTION A

Current and current density, equation of continuity. Microscopic form of Ohm's Law ($J = \sigma E$) and conductivity. Failure of Ohm's Law. Invariance of charge. E in different frames of reference. Field of a point charge moving with constant velocity. Interaction between moving charges and force between parallel currents. Behaviour of various substances in magnetic field. Definition of M and H and their relation to free and bound currents. Permeability and susceptibilities and their inter-relationship. Orbital motion of electrons and diamagnetism. Electron spin and paramagnetism. Ferromagnetism. Domain theory of Ferromagnetism. Hysteresis Loss. Magnetisation curve. Ferrites..

SECTION B

Lorentz's force. Definition of B . Biot Savart's Law and its applications to long straight wire, circular current loop and solenoid. Ampere's Circuital law and its application. Divergence and curl of B . Hall effect expression and co-efficient. Vector potential, Definition and derivation of current density-definition its use in calculation or change in magnetic field at a current sheet. Transformation equation of E and B from one frame to another. Faraday's Law of EM induction. Displacement current. Maxwell's equations. Mutual inductance and reciprocity theorem. Self inductance L for solenoid. Coupling of Electrical circuits. Analysis of LCR series and parallel resonant circuits. Q -factor. Power consumed power factor..

Text Books:

1. Fundamentals of Electricity and Magnetism by Author F.Kipp.
2. Electricity and Magnetism. Berkeley Physics Course. Vol. II by E.M Purcell, McGraw-Hill, 1965.
3. Introduction to classical Electrodynamics by David Griffith.
4. EM waves and Radiating systems by Edward C. Jordan and K.G Balmain.

B.Sc. (Physics)
General Guidelines for Physics Practical Examination

Maximum Marks :	External	22
	Internal	08
	Total	30

1. The student will be asked to perform one experiment out of the experiments mentioned in syllabus.
2. The distribution of marks is as follows :
 - (i) One full experiment requiring the student to take some data, analyse it and draw conclusions-(candidates are expected to state their results with limits of error. (10)
 - (ii) Brief theory (04)
 - (iii) Viva-Voce (04)
 - (iv) Record(Practical File) (04)
3. There will be one session of 03 hours duration. The paper will consist of 08 experiments out of which an examinee will mark 06 experiments and one of these is to be allotted by the external examiner.
4. Number of candidates in a group for practical examination should not exceed 12.
5. In a single group no experiment be allotted to more than three students in any group.
6. The student should determine Standard Deviations and probable error in the calculations where needed.

Practical Semester II

(75 hours)

1. To study the variation of time period with distance between centre of suspension and centre of gravity for a bar pendulum and to determine
 - i) Radius of gyration of bar pendulum about an axis through its Centre of Gravity and perpendicular to its length.
 - ii) Value of Centre of Gravity, g .
2. Determination of g by Kater's pendulum.
3. Determination of modulus of rigidity of material of a wire using Maxwell's needle.
4. Measurement for logarithmic decrement, co-efficient of damping, relaxation time and quality factor of a damped simple pendulum.
5. To determine the frequency of AC mains using a sonometer and an electro magnet.
6. To determine the low resistance using Carey Foster Bridge.
7. Determination of unknown capacitance by flashing and quenching of neon lamp.
8. Study the phase relationships between voltage and current using impedance triangle.
9. To study the resonance in series and parallel LCR circuits for different resistances and calculate Q-value.
10. To determine the given inductance by Anderson's bridge.
11. Verify laws of electromagnetic induction.
12. To study the induced emf as function of velocity.

Text and Reference Books:

1. B.Sc. Practical Physics, By C.L.Arora, S.Chand & Co.
2. A Laboratory Manual of Physics for undergraduate classes by D.P.Khandelwal

**B.SC. (PHYSICS) PART-I (Ist & IInd SEMESTER
SESSION 2020-21, 2021-22, 2022-23**

PAPER A : Mechanics -I

PAPER A : Mechanics-II

- 1 Dr. Manjitinder Kaur,
Department of Physics, Govt. Mohindra College, Patiala.
Mobile No: 94179-76418
- 2 Dr. Makhan Singh,
Department of Physics, Govt. Rajindra College, Bathinda.
Mobile No : 98154-92001
- 3 Dr. Gurdeep Singh Sekhon
Department Of Physics, Govt. College, Mohali.
Mobile No : 98882-89101
- 4 Dr. Harvinder Singh ,
Department of Physics, Govt. Ripudman College, Nabha.
Mobile No 95017-58600
- 5 Surinder Singla
Department of Physics,
Govt. Ranbir College, Sangrur, Cell No. 9417383906
- 6 Dr. Baljit Singh,
Department of Physics, Khalsa College, Bela.
Mobile No 98149-26827

PAPER B : VIBRATIONS AND WAVES-I

PAPER B : VIBRATIONS AND WAVES-II

- 1 Dr. Manju Midha,
Department of Physics, Govt. Mahindra College, Patiala.
Mobile No 98723-75737
- 2 Dr. Harvinder Singh,
Department of Physics, Govt. Ripudaman College, Nabha.
Mobile No 950175-8600
- 3 Professor Harjinder Singh Mann,
Department of Physics, Govt. Rajindra College, Bathinda.
Mobile No : 98157-29166
- 4 Dr. Meera Rani,
Department of Physics, Govt. College, Ropar.
Mobile No : 94175-90982
- 5 Dr. Gurdeep Singh Sekhon
Department of Physics, Govt. College Mohali.
Mobile No: 98882-89101
- 6 Professor Jatinder Singh Gill,
Department of Physics, Govt. College, Ropar
Mobile No 81460-22995.

- 7 Professor Harpal Kaur,
Department of Physics, Govt. Mohindra College, Patiala
Mobile No : 977791-73989
- 8 Dr. Makhan Singh
Department of Physics, Govt. Rajindera College, Bathinda
Mobile No. 98154-92001
- 9 Dr. Manjitinder Kaur,
Department of Physics, Govt. Mohindra College, Patiala
Mobile No 94179-76418

Paper C Electricity and Magnetism-I

Paper C Electricity and Magnetism-II

- 1 Dr. Makhan Singh
Department of Physics, Govt. Rajindera College, Bathinda
Mobile No. 98154-92001
- 2 Professor Ravinder Singh,
Department of Physics, Govt. Mohindra College, Patiala.
Mobile No : 94170-96353
- 3 Surinder Singla
Department of Physics,
Govt. Ranbir College, Sangrur,
Cell No. 9417383906
- 4 Professor Jatinder Singh Gill,
Department of Physics, Govt. College, Ropar.
Mobile No : 8146022995
- 5 Dr. Meera Rani,
Department of Physics, Govt. College, Ropar
Mobile No : 9417590982
6. Dr. Lovleen
Department of Physics, Govt. College for Women, Patiala.
Mobile No : 98147- 15350

PRACTICALS

1. Mrs. Manjitinder Kaur,
Department of Physics, Govt. Mahindra College, Patiala. Mobile: 98153 16929
2. Dr.Makhan Singh,
Department of Physics, Govt. Rajindra College, Bathinda. Mobile: 98154 92001
3. Dr. Gurdeep Singh Sekhon
Department of Physics, Govt. College, Mohali. Mobile: 988828 89101
4. Dr. Harvinder Singh ,
Department of Physics, Govt. Ripudman College, Nabha. Mobile: 950175-8600
5. Mr. B.S. Stayal,
Department of Physics, Govt.College Ropar. Mobile: 94170 22131
6. Dr. Gurpreet Singh
Department of Physics, DAV College Bathinda.
7. Dr. Baljit Singh
Department of Physics, Khalsa College Bela. Mobile No: 98149-26827
- 8 Mrs. Harpal Kaur,
Department of Physics, Govt. Mohindra College, Patiala Mobile: 977791-73989
- 9 Mr. Inderjit Singh
Department of Physics, Govt. College, Ropar Mobile: 98767-85054
- 10 Mr. Harjinder Singh Mann,
Department of Physics, Govt. Rajindra College, Bathinda. Mobile: 98157-29166
- 11 Mr. Ravinder Singh,
Department of Physics, Govt. Mohindra College, Patiala. Mobile: 94170-96353
- 12 Dr. Loveleen,
Department of Physics, Govt. College for Women, Patiala. Mobile: 98147 15350
- 13 Dr.Jagdish Singh,
Department of Physics, Guru Teg Bahadur College, Anandpur Sahib
- 14 Mrs. Anoop Kaur
Department of Physics, Govt. College, Faridkot.
- 15 Mr. Jatinder Singh Gill,
Department of Physics, Govt. College, Ropar. Mobile No: 81460 22995
- 16 Dr. Manjit Singh Saini,
Department of Physics, Govt. Mohindra College, Patiala. Mobile No: 94179 76418
- 17 Dr.Meera Rani,
Department of Physics, Govt. College, Ropar Mobile No: 94175 90982
- 18 Mr. Joginder Singh Batra,
Department of Physics, Govt. College, Mohali. Mobile No: 98158-46609
- 19 Dr. M.P.Singh,
Guru Kashi College, Talwandi Sabo, Mobile No : 94170-67792
- 20 Dr. Jaspal Singh,
Department of Physics, Punjabi University Girls College, Mansa
Mobile No: 94780 11059

- 21 Dr. Tajinder Singh
Department of Physics, Mata Gujri College, Fatehgarh Sahib. Mobile: 97819 86678
- 22 Surinder Singla
Department of Physics, Govt. Ranbir College, Sangrur, Cell No. 9417383906

B.A./B.Sc.-Ist Year (Ist Semester)

MATHEMATICS

SESSION - 2020-21, 2021-22, 2022-23

Paper I: Calculus-I

Maximum Marks: 50 Marks

Pass Percentage: 35%

Maximum Time : 3 Hrs

Private/Distance Education Students

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Sections A and B and compulsory question of Section C.

Section-A

Differential Calculus: $\epsilon - \delta$ definition of the limit of a function. Basic properties of limits. Continuous functions and classification of discontinuities. Differentiability. Derivative of nth order, Leibnitz theorem, Asymptotes. Test for concavity and convexity, Points of inflexion, Tracing of Curves with y' and y'' (Standard curves in Cartesian form without use of Grapher).

Section-B

Functions of several variables: Limits, continuity and differentiability of two variables. Partial derivatives and its Linearization, Chain rule, Partial derivative with constrained variables. Homogeneous functions, Euler theorem and its applications, Extreme values and saddle points, Lagrange multipliers, Taylor's theorem and its linear and quadratic approximation.

RECOMMENDED BOOKS :

1. Malik and Arora, Mathematical Analysis, New Academic Science, 2017
2. Thomas and Finney, Calculus and Analytic Geometry, Ninth Edition.
3. R. K. Jain and S.R.K. Iyengar: Advanced Engineering Mathematics, Narosa Publishing House.

Head
Mathematics Deptt.
Punjab University, Patiala

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PAPER-II: DIFFERENTIAL EQUATIONS

Maximum Marks: 50 Marks

Pass Percentage: 35%

Maximum Time : 3 Hrs

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

Section-A

First order differential equations : Order and degree of a differential equation, Separable differential equations, Homogeneous differential equations, equations reducible to Homogenous differential equations , Exact differential equations, Linear differential equations and equations reducible to linear differential equations.

Higher order differential equations : Wronskian, Solution of Linear homogeneous and non-homogeneous differential equations of higher order with constant coefficients and with variable coefficients, Method of Variation of Parameters.


Section-B

Higher order differential equations : Differential operator method, Linear non-homogeneous differential equations with variable coefficients, Euler's Cauchy method.

Series solution of Differential equation: Regular point, ordinary point, Power Series method. Frobenius method, Bessel and Legendre Equations, Legendre and Bessel functions and their properties , recurrence relations, orthogonality, Rodrigue's formula.

RECOMMENDED BOOKS :

1. George F .Simmons ; Differential Equations with Aplication and historical Notes(Textbooks in Mathematics) CRC press
2. Rai Singhania : Ordinary and Partial Differential Equations , S.Chand & Company, New Delhi
3. Zafar Ahsan: Differential Equations and Their Applications, Prentice-Hall of India Pvt. Ltd. New Delhi-Second edition
4. H.T.H. Piaggio : An Elementry Treatise on Differential equations : Barman Press.


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 Mathematics Deptt.
 Punjabi University, P

HJC

PAPER-III: LINEAR ALGEBRA

Maximum Marks: 50 Marks

Pass Percentage: 35%

Maximum Time : 3 Hrs

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

Objective: This course familiarizes the students with the study of matrices which is used in solving linear equations and basic notions in linear algebra that are often used in mathematics and other sciences.

Section-A

Elementary operation on matrices, Inverse of a matrix using Gauss Jordan Method. Linear independence of row and column vectors, Row rank, Column rank and their equivalence. Eigen values, Eigen vectors and the characteristic equation of a matrix, Diagonalization, Cayley-Hamilton theorem and its use in finding inverse of a matrix, Consistency of a system of linear equations.

Section-B


Vector spaces. Examples, Linear Dependence, Linear Combinations, Bases and Dimension. Subspaces, Linear transformation, Algebra of linear transformations, Matrices as linear transformations, Matrices and change of basis, Kernel and image, Rank and Nullity theorem.



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Mathematics Deptt.
Punjabi University, Patiala

RECOMMENDED BOOKS :

1. Gilbert Strang: Linear Algebra and its Applications, Cengage Learning Publishers (Fourth Edition)
2. P.B. Bhattacharya, S.K.Jain & S.R.Nagpaul : first course in Linear Algebra, New Age International (P) Limited
3. Serge Lange: Introduction to Linear Algebra, Springer
4. Kenneth Hoffman , Kunze : Linear Algebra, PHI (Second Edition)
5. Charles W. Curtis: Linear Algebra An Introductory Approach, Springer



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Punjabi University, Patiala

5/c

137C

B.A./ B.Sc .-Ist Year (2nd Semester)

MATHEMATICS

SESSION : 2020-21, 2021-22, 2022-23

PAPER-IV: CALCULUS-II

Maximum Marks: 50 Marks

Pass Percentage: 35%

Maximum Time : 3 Hrs

Handwritten mark

For Private/Distance Education Students

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

Objective: The objective is to introduce Vector Analysis and the Calculus of Several Variables and their applications

Section-A

Integral Calculus

Double integrals, Double integrals in Polar Form, Change of order and change of variable in double integral. Triple integrals in Rectangular co-ordinates. Triple integrals in Cylindrical and Spherical co-ordinates. Applications to evaluation of Areas, Volume, Centre of Gravity and Moments of Inertia.

Section-B

Vectors in the plane . Cartesian Co-ordinates and vectors in spaces, Dot and cross products. Lines and planes in space. Line integrals, vector fields , work circulations and flux, Path independence. Potential Functions and Conservative Fields, Green theorem in Plane. surface area and surface integrals. Stokes Theorem and the divergence theorem.

RECOMMENDED BOOKS :

1. Malik and Arora ,Mathematical Analysis, New Academic Science, 2017
2. Thomas and Finney ,Calculus and Analytic Geometry, Ninth Edition.
3. R. K. Jain and S.R.K. Iyengar:Advanced Engineering Mathematics,Narosa Publishing House.

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 Head
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 Punjabi University, Patiala

12/10

41c

PAPER-V: PARTIAL DIFFERENTIAL EQUATIONS

Maximum Marks: 50 Marks
Maximum Time : 3 Hrs

Pass Percentage: 35%

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

Objective: The objective of the course is to equip the students with the knowledge of Partial differential equations of first, second and higher orders and their applications

Section-A

Partial differential equations : Partial differential equation of first order, Lagrange's solution, Integral surfaces passing through a given curve, surfaces orthogonal to a given system of surfaces, Partial differential equation of first order but of any degree, Charpit's general method of solution.

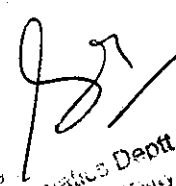
Partial differential equations of second and higher order : Partial differential equations of the second order and their classification into hyperbolic, elliptic and parabolic types, canonical forms.

Section-B

Homogeneous and non-homogeneous partial differential equations with constant coefficients One dimension Wave and Heat Equation. Two dimensional Laplace equation by separation of variable method and D'Alembert's solution of wave equation.

RECOMMENDED BOOKS :

1. George F. Simmons : Differential Equations with Application and historical Notes (Textbooks in Mathematics) CRC press
2. Rai Singhania : Ordinary and Partial Differential Equations", S.Chand & Company, New Delhi
3. I. N. Sneddon . Elements of Partial Differential Equations, Mc Graw Hill Book Co.
4. Zafar Ahsan: Differential Equations and Their Applications, Prentice-Hall of India Pvt. Ltd. New Delhi-Second edition
5. H.T.H. Piaggio : An Elementary Treatise on Differential equations : Barman Press.


H.O.S
Mathematics Deptt.
Punjab University, Patiala

3/c

PAPER-VI : ANALYTIC GEOMETRY

Maximum Marks: 50 Marks
Maximum Time : 3 Hrs

Pass Percentage: 35%

INSTRUCTIONS FOR THE PAPER-SETTER

The question paper will consist of three sections A, B and C. Sections A and B will have four questions each from the respective sections of the syllabus and Section C will consist of one compulsory question having eight short answer type questions covering the entire syllabus uniformly. Each question in Sections A and B will be of 7.5 marks and Section C will be of 20 marks.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt five questions in all selecting two questions from each of the Section A and B and compulsory question of Section C.

Objective: This course introduces two and three dimensional geometry. It familiarizes the students with the study of conics, oblique axes, cone, cylinder and conicoid

Section-A

General Equation of Second Degree: conic section, centre of conic section, principal axes and eccentricity of a conic, axis, latus rectum, vertex and focus of a parabola, tracing of cones

Polar Equation of a conic: tracing of the conic, chord joining two points, tangents, normals, polar, director circle and asymptotes.

Introduction of Oblique Axes: distance between two points, equation of a line, angle between two lines, length of perpendicular, angle between the pair of lines, oblique axes from rectangular axes, invariants, equation of circle, parabola, ellipse, hyperbola

Section-B


Sphere: Section of a sphere by a plane, sphere through a given circle. Intersection of a line and sphere, tangent line, tangent plane, angle of intersection of two spheres and condition of orthogonality

Cone: general second degree equation of a cone, its intersection with a plane and with a line, enveloping cone, right circular cone, the cone $ax^2 + by^2 + cz^2 = 0$

Cylinder: enveloping cylinder, right circular cylinder

RECOMMENDED BOOKS :

1. P.K. Jain and Khalil Ahmad: Text Book of Analytical Geometry. New Age International Publishers, Third Edition
2. Shanti Narayan and P.K Mittal: Analytical Solid Geometry, 17th Revised Edition, S.Chand and Co., New Delhi, 2006.
3. N.Saran and R.S. Gupta : Analytical Geometry of Three Dimensions, Pothishala Pvt. Ltd. Allahabad.


Maths Dept.
Panjab University, Patna

(ਹ) ਫਲਾਂ-ਸਬਜ਼ੀਆਂ ਦੇ ਨਾਂ

(ਕ) ਪਸ਼ੂ-ਛਪੰਛੀਆਂ ਦੇ ਨਾਂ

(ਖ) ਪੰਜਾਬੀ ਰਿਸ਼ਤਾ-ਨਾਤਾ ਪ੍ਰਬੰਧ ਦੀ ਸ਼ਬਦਾਵਲੀ

(ਗ) ਘਰੇਲੂ ਵਸਤਾਂ ਦੀ ਸ਼ਬਦਾਵਲੀ

15 ਅੰਕ

ਭਾਗ-ੲ ਸਾਰੇ ਪਾਠਕ੍ਰਮ ਤੇ ਆਧਾਰਿਤ ਆਬਜੈਕਟਿਵ ਟਾਈਪ / ਸੰਖੇਪ ਉਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

15x2=30 ਅੰਕ

ਅੰਕ ਵੰਡ ਤੇ ਪੇਪਰ ਸੈਂਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਵਿਦਿਆਰਥੀ ਪਹਿਲੀ ਵਾਰ ਗੁਰਮੁਖੀ ਲਿਪੀ ਸਿੱਖ ਰਹੇ ਹਨ। ਹੇ ਸਕਦਾ ਹੈ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੋਂ ਅਨਜਾਣ ਹੋਣ। ਸੋ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਪੱਧਰ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੀਮਾ ਨੂੰ ਧਿਆਨ ਵਿੱਚ ਰੱਖ ਕੇ ਨਿਸ਼ਚਤ ਕੀਤਾ ਜਾਵੇ।
2. ਸਾਰੇ ਭਾਗਾਂ ਵਿੱਚੋਂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ।
3. ਸਰਲ ਤੇ ਸਪਸ਼ਟ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ।
4. ਵਰਣਾਤਮਕ ਪ੍ਰਸ਼ਨ ਨਾ ਪੁੱਛੇ ਜਾਣ।
5. ਵਿਦਿਆਰਥੀ ਨੂੰ ਲਿਪੀ ਦਾ ਬੋਧ ਕਰਵਾਉਣ ਲਈ ਧੁਨੀਆਂ, ਲਿਪੀ ਚਿੰਨ੍ਹਾਂ ਦੀ ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ ਸਬੰਧੀ ਸੰਖੇਪ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ। ਲੋੜ ਅਨੁਸਾਰ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਛੋਟੇ ਜਾਂ ਚੋਟੇ ਦੇਣੀ ਲਾਜ਼ਮੀ ਹੈ।
6. ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਦੇ ਸਾਰੇ ਭਾਗਾਂ ਵਿੱਚੋਂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ। ਲੋੜ ਅਨੁਸਾਰ ਚੋਣ ਅਤੇ ਛੋਟੇ ਦਿੱਤੀ ਜਾਵੇ।

ਸਹਾਇਕ ਪਾਠ ਸਮੱਗਰੀ

1. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਆਓ ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2009. (ਹਿੰਦੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿੱਖਣ ਲਈ)
2. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਗੁਰਮੁਖੀ ਸਿੱਖੇ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011. (ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿੱਖਣ ਲਈ)
3. ਸੀਤਾ ਰਾਮ ਬਾਹਰੀ, ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2002 (ਹਿੰਦੀ)
4. ਰਾਜਵਿੰਦਰ ਸਿੰਘ, ਪੰਜਾਬੀ ਗਿਆਨ ਸੀ.ਡੀ. (ਕੰਪਿਊਟਰ ਐਪਲੀਕੇਸ਼ਨ ਟੂ-ਲਰਨ ਐਂਡ ਟੀਚ ਪੰਜਾਬੀ), ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ 2011.
5. Hardev Bahri, Teach Yourself Punjabi, Publication Bureau, Punjabi University, Patiala, 2011.
6. Henry A. Gleason and Harjeet Singh Gill, A Start in Punjabi, Publication Bureau, Punjabi University, Patiala, 1997.
7. Ujjal Singh Bahri and Paramjit Singh Walia, Introductory Punjabi, Publication Bureau, Punjabi University, Patiala, 2003.

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ (ਮੁੱਢਲਾ ਗਿਆਨ) ਭਾਗ-ਪਹਿਲਾ
(ਅੰਡਰ-ਗ੍ਰੈਜੂਏਟ ਪੱਧਰ ਦੇ ਸਾਰੇ ਕੋਰਸਾਂ ਲਈ ਸਾਂਝਾ ਸਿਲੇਬਸ)

2020-21, 2021-22 ਅਤੇ 2022-23 ਸੈਸ਼ਨ ਲਈ

ਰੈਗੂਲਰ ਵਿਦਿਆਰਥੀਆਂ ਲਈ

ਕੁਲ ਅੰਕ : 100

ਵਿਸ਼ੇ ਵਿੱਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 35

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ : 25 ਅੰਕ

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿੱਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 09

ਬਾਹਰੀ ਪਰੀਖਿਆ: 75 ਅੰਕ

ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿੱਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 26

ਸਮਾਂ : 3 ਘੰਟੇ

(ਅਧਿਆਪਨ: 50 ਪੀਰੀਅਡ, 6 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

ਭਾਗ-ਓ (1). ਸ਼ਬਦ ਪ੍ਰਬੰਧ: ਸ਼ਬਦ ਜੋੜਾਂ ਦੀ ਵਰਤੋਂ

(ੳ) ਦੋ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ-ਜੋੜ

(ਅ) ਤਿੰਨ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ-ਜੋੜ

(ੲ) ਬਹੁ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ-ਜੋੜ

15 ਅੰਕ

(2). ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼ਰੇਣੀਆਂ ਤੇ ਵਿਆਕਰਨਕ ਵਰਗਾਂ ਦੀ ਪਛਾਣ

(ੳ) ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼ਰੇਣੀਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ (ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ ਆਦਿ)

(ਅ) ਵਿਆਕਰਨਕ ਵਰਗਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ (ਲਿੰਗ, ਵਚਨ, ਪੁਰਖ, ਕਾਲ ਆਦਿ)

10 ਅੰਕ

ਭਾਗ-ਅ (1). ਸ਼ਬਦ ਬਣਤਰਾਂ ਤੇ ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ ਤੇ ਵਰਤੋਂ

(ੳ) ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰਾਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਸਮਾਸ, ਦੁਹਰਕਤੀ)

(ਅ) ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ (ਵਾਕੰਸ਼, ਉਪ-ਵਾਕ ਤੇ ਵਾਕ)

(ੲ) ਸ਼ਬਦਾਂ ਦਾ ਵਿਆਕਰਨਕ ਮੇਲ: ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ

10 ਅੰਕ

(2). ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।

10 ਅੰਕ

ਭਾਗ-ੲ ਸਾਰੇ ਪਾਠਕ੍ਰਮ ਤੇ ਆਧਾਰਿਤ ਆਬਜੈਕਟਿਵ ਟਾਈਪ / ਸੰਖੇਪ ਉਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

15x2=30 ਅੰਕ

ਅੰਕ ਵੰਡ ਤੇ ਪੇਪਰ ਸੈਂਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਵਿਦਿਆਰਥੀ ਪਹਿਲੀ ਵਾਰ ਗੁਰਮੁਖੀ ਲਿਖੀ ਸਿੱਖ ਰਹੇ ਹਨ। ਹੋ ਸਕਦਾ ਹੈ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੋਂ ਅਨਜਾਣ ਹੋਣ। ਸੋ

ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਪੱਧਰ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੀਮਾ ਨੂੰ ਧਿਆਨ ਵਿੱਚ ਰੱਖਕੇ ਨਿਸ਼ਚਤ ਕੀਤਾ ਜਾਵੇ।

2. ਸਾਰੇ ਭਾਗਾਂ ਵਿੱਚੋਂ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ।

3. ਸਰਲ ਤੇ ਸਪਸ਼ਟ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ।

4. ਵਰਣਾਤਮਕ ਪ੍ਰਸ਼ਨ ਨਾ ਪੁੱਛੇ ਜਾਣ।

5. ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਵਿਆਕਰਨ ਦੀ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ ਸਬੰਧੀ ਸੰਖੇਪ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ। ਲੋੜ ਅਨੁਸਾਰ ਵਿਦਿਆਰਥੀ ਨੂੰ ਛੋਟੇ ਜਾਂ ਚੋਣ ਦੇਣੀ ਲਾਜ਼ਮੀ ਹੈ।

ਸਹਾਇਕ ਪਾਠ ਸਮੱਗਰੀ

1. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਆਓ ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2009. (ਹਿੰਦੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿੱਖਣ ਲਈ)
2. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਗੁਰਮੁਖੀ ਸਿੱਖੇ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011. (ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿਖਣ ਲਈ)
3. ਸੀਤਾ ਰਾਮ ਬਾਹਰੀ, ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2002 (ਹਿੰਦੀ)
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ਬੀ.ਏ ਭਾਗ-ਪਹਿਲਾ (ਸਮੈਸਟਰ)

(ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ)

2020-21, 2021-22 ਅਤੇ 2022-23 ਸੈਸ਼ਨਾਂ ਲਈ

ਸਮੈਸਟਰ ਪਹਿਲਾ

ਕੁਲ ਅੰਕ : 100

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ : 25 ਅੰਕ

ਬਾਹਰੀ ਪਰੀਖਿਆ: 75 ਅੰਕ

ਸਮਾਂ : 3 ਘੰਟੇ

ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 35

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 09

ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 26

(ਅਧਿਆਪਨ: 6 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

ਸਿਲੇਬਸ ਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਭਾਗ-ੳ-1: ਕਹਾਣੀ ਕੀ ਹੁੰਦੀ ਹੈ?

ਨਿੱਕੀ ਕਹਾਣੀ, ਲੰਮੀ ਕਹਾਣੀ, ਮਿੰਨੀ ਕਹਾਣੀ ਦੀ ਬਣਤਰ, ਸਰੂਪ ਅਤੇ ਆਪਸੀ ਵੱਖਰੇਵਾਂ 12 ਅੰਕ

ਭਾਗ ੳ-2: ਕਥਾ ਪੰਜਾਬ, ਸੰਪਾ. ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ, ਨੈਸ਼ਨਲ ਬੁੱਕ ਟ੍ਰਸਟ, ਇੰਡੀਆ (ਅਧਿਆਪਕ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਕਹਾਣੀ ਦੇ ਸਾਰ, ਤੱਤਸਾਰ, ਵਿਸ਼ੇ ਬਾਰੇ ਦੱਸੇਗਾ ਅਤੇ ਕਹਾਣੀ ਦੀ ਸਾਹਿਤਕ ਕਲਾ ਬਾਰੇ ਜਾਣੂੰ ਕਰਵਾਏਗਾ ਅਤੇ ਨਾਲ ਹੀ ਉਨ੍ਹਾਂ ਨੂੰ ਇਨ੍ਹਾਂ ਬਾਰੇ ਆਪਣੇ ਵਿਚਾਰ ਬਨਾਉਣ ਅਤੇ ਆਪਣਾ ਸਿਰਜਣਾਤਮਕ ਹੁੰਗਾਰਾ ਸਿਰਜਣ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰੇਗਾ) 12 ਅੰਕ

ਭਾਗ-ਅ 1: ਪੰਜਾਬੀ ਲਿਖਣ ਕਲਾ: ਹੇਠ ਲਿਖੇ ਰੂਪਾਂ ਦਾ ਸਰੂਪ. ਆਪਸੀ ਨਿਖੇੜਾ ਅਤੇ ਵਿਹਾਰਕ ਅਭਿਆਸ

1) ਲੇਖ 2) ਪੈਰਾ 3) ਅਖ਼ਬਾਰੀ ਲੇਖ 4) ਮਿਡਲ 5) ਪ੍ਰੈਸ ਰਿਪੋਰਟ 6) ਖ਼ਬਰ 12 ਅੰਕ

(ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਲਈ ਅਸਾਈਨਮੈਂਟ ਦੇ ਤੌਰ 'ਤੇ ਵਿਦਿਆਰਥੀ ਨੂੰ ਇਨ੍ਹਾਂ ਰੂਪਾਂ ਨਾਲ ਸੰਬੰਧਿਤ 50 ਪੰਨਿਆਂ ਦੀ ਸਕਰੈਪ ਬੁੱਕ ਤਿਆਰ ਕਰਨ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ ਜਿਸ ਵਿਚ ਉਹ ਹਰ ਰੂਪ ਨਾਲ ਸੰਬੰਧਿਤ ਘੱਟ ਤੋਂ ਘੱਟ 4 ਲਿਖਤਾਂ ਲਿਖੇਗਾ ਅਤੇ ਉਸ ਦੇ ਆਧਾਰ 'ਤੇ ਅਸਾਈਨਮੈਂਟ ਦੇ ਅੰਕ ਲਗਾਏ ਜਾਣਗੇ।)

ਭਾਗ ਅ 2: ਲੇਖ ਰਚਨਾ: ਸਮਕਾਲ ਨਾਲ ਸੰਬੰਧਿਤ ਸਮਾਜਿਕ ਮਸਲਿਆਂ (ਸਮਾਜਿਕ ਨਿਆਂ, ਲਿੰਗਕ ਬਰਾਬਰੀ, ਧਰਮ-ਨਿਰਪੇਖਤਾ ਅਤੇ ਖੇਤਰਵਾਦ) ਬਾਰੇ, ਸਿੱਖਿਆ ਵਿਚ ਮਾਤ ਭਾਸ਼ਾ ਦੇ ਮਹੱਤਵ ਬਾਰੇ, ਵਿਗਿਆਨ ਸਿੱਖਿਆ ਤੇ ਮਾਤਭਾਸ਼ਾ, ਤਕਨੀਕੀ ਵਿਕਾਸ ਅਤੇ ਵਾਤਾਵਰਣ, ਅਜੋਕੀ ਗੀਤਕਾਰੀ ਵਿਚ ਹਿੰਸਾ, ਜਾਤਪਾਤ ਅਤੇ ਲੱਚਰਤਾ ਬਾਰੇ, ਸਾਈਬਰ-ਕ੍ਰਾਂਤੀ ਅਤੇ ਮਨੁੱਖੀ ਅਧਿਕਾਰਾਂ ਦੇ ਮਸਲੇ, ਇੰਟਰਨੈੱਟ ਦਾ ਪਾਸਾਰ ਦੀਆਂ ਮੁਸ਼ਕਿਲਾਂ, ਤਕਨੀਕੀ ਵਿਕਾਸ ਅਤੇ ਸਮਾਜਿਕ ਆਰਥਿਕ ਪਿਛੜੇਵਾਂ ਦੇ ਸੰਬੰਧ ਬਾਰੇ, ਆਨਲਾਈਨ ਅਧਿਆਪਨ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਅਤੇ ਸੰਭਾਵਨਾਵਾਂ ਬਾਰੇ, ਸਿੱਖਿਆ ਦੇ ਆਨਲਾਈਨ ਮਾਧਿਅਮ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ ਤੇ ਸੀਮਾਵਾਂ ਬਾਰੇ, ਸਮਾਜਿਕ-ਮੀਡੀਆ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ ਤੇ ਸਮੱਸਿਆਵਾਂ ਬਾਰੇ, ਮੀਡੀਆ ਅਤੇ ਸਭਿਆਚਾਰ ਬਾਰੇ, ਪੰਜਾਬੀ ਸਭਿਆਚਾਰਕ ਵਿਰਾਸਤ ਅਤੇ ਸਭਿਆਚਾਰਕ ਤਬਦੀਲੀ ਬਾਰੇ, ਨੌਜਵਾਨ ਪੀੜੀ ਦੇ ਸੁਪਨੇ ਅਤੇ ਆਦਰਸ਼, ਬੇਰੁਜਗਾਰੀ ਅਤੇ ਪਰਵਾਸ, ਪੰਜਾਬੀਆਂ ਵਿਚ ਪਰਵਾਸ ਦੇ ਰੁਝਾਨ ਦੇ ਕਾਰਣਾਂ ਬਾਰੇ ਨਿਬੰਧ ਰਚਨਾ 09 ਅੰਕ

ਭਾਗ-ੲ: ਪਾਠਕ੍ਰਮ ਦੇ ਭਾਗ-ੳ ਅਤੇ ਭਾਗ-ਅ-1 (ਪੰਜਾਬੀ ਲਿਖਣ ਕਲਾ) ਵਾਲੇ ਭਾਗ ਵਿਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ।

30 ਅੰਕ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਂਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਪਾਠਕ੍ਰਮ ਦੇ ਦੋ ਭਾਗ ੳ ਅਤੇ ਅ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤਿੰਨ ਭਾਗ ੳ, ਅ ਅਤੇ ੲ ਹੋਣਗੇ।

2. ਪੇਪਰ ਨੂੰ ਤਿੰਨ ਭਾਗਾਂ ੳ, ਅ ਅਤੇ ੲ ਵਿੱਚ ਵੰਡਿਆ ਜਾਵੇਗਾ।

3. ਭਾਗ ੳ-1) ਵਿਚੋਂ 2 ਪ੍ਰਸ਼ਨ ਖੁੱਛੇ ਜਾਣਗੇ, ਜਿਨ੍ਹਾਂ ਵਿਚੋਂ ਵਿਦਿਆਰਥੀ ਇੱਕ ਪ੍ਰਸ਼ਨ ਦਾ ਉੱਤਰ ਦੇਵੇਗਾ। ਇਹ ਪ੍ਰਸ਼ਨ ਦਿੱਤੇ ਗਏ ਸਾਹਿਤ ਰੂਪਾਂ ਦੇ ਸਰੂਪ, ਤੱਤਾਂ ਬਾਰੇ ਜਾਂ ਇਨ੍ਹਾਂ ਵਿਚਕਾਰ ਸਮਾਨਤਾਵਾਂ ਜਾਂ ਅੰਤਰਾਂ ਬਾਰੇ ਹੋਣਗੇ। 12 ਅੰਕ

4. ਭਾਗ ੳ-2 ਵਿਚੋਂ ਤਿੰਨ ਕਹਾਣੀਆਂ ਦੇ ਕੇ ਕਿਸੇ ਇੱਕ ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ/ਸਾਰ/ ਪਾਠਕ ਦਾ ਹੁੰਗਾਰਾ, ਪਾਠਕੀ ਵਿਆਖਿਆ ਕਰਨ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। 12 ਅੰਕ





5. ਭਾਗ ਅ-1 ਵਿਚ ਦਰਸਾਏ ਗਏ ਲੇਖਣੀ ਰੂਪਾਂ ਦੇ ਸਰੂਪ ਅਤੇ ਇਨ੍ਹਾਂ ਵਿਚਕਾਰ ਨਿਖੇੜੇ ਬਾਰੇ ਤਿੰਨ ਸਵਾਲ ਪੁੱਛੇ ਜਾਣਗੇ। ਇਨ੍ਹਾਂ ਵਿੱਚੋਂ ਵਿਦਿਆਰਥੀ ਨੂੰ ਕਿਸੇ ਇੱਕ ਸਵਾਲ ਦਾ ਉੱਤਰ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। 12 ਅੰਕ
6. ਭਾਗ ਅ-2 ਦਰਸਾਏ ਵਿਸ਼ਿਆਂ ਵਿੱਚੋਂ ਕਿਸੇ ਵਿਸ਼ੇ ਤੇ ਨਿਬੰਧ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। (ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 09 ਅੰਕ
6. ਭਾਗ-ਬ ਇਸ ਭਾਗ ਵਿਚ ਭਾਗ ਓ ਅਤੇ ਭਾਗ ਅ-1 (ਪੰਜਾਬੀ ਲਿਖਣ ਕਲਾ) ਵਿੱਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ 15 (ਭਾਗ ਓ ਵਿੱਚੋਂ 10 ਅਤੇ ਭਾਗ ਅ-1 (ਪੰਜਾਬੀ ਲਿਖਣ ਕਲਾ) ਵਿੱਚੋਂ 5) ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀ ਨੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਸੰਖੇਪ ਉੱਤਰ ਦੇਣੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 2 ਅੰਕ ਹੋਣਗੇ। 15x2=30 ਅੰਕ

ਸਹਾਇਕ ਪਾਠ-ਸਮੱਗਰੀ

1. ਰਾਜਿੰਦਰਪਾਲ ਸਿੰਘ, ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਾਹਿਤ ਰੂਪਾਕਾਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ
2. ਓਮ ਪ੍ਰਕਾਸ਼ ਵਸਿਸ਼ਟ, ਕੋਸ਼-ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਕੋਸ਼ਕਾਰੀ, ਨੈਨਸੀ ਪਬਲਿਸ਼ਰਜ਼. ਚੰਡੀਗੜ੍ਹ
3. ਪਰਮਜੀਤ ਸਿੰਘ ਸਿੱਧੂ, ਕੋਸ਼ਕਾਰੀ-ਕਲਾ ਅਤੇ ਪੰਜਾਬੀ ਕੋਸ਼ਕਾਰੀ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ
4. ਅਮਰਜੀਤ ਸਿੰਘ ਵੜੈਚ, ਹੁਣ ਤੁਸੀਂ ਖ਼ਬਰਾਂ ਸੁਣੋ




ਬੀ.ਏ. ਭਾਗ-ਪਹਿਲਾ (ਸਮੈਸਟਰ)

(ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ)

2020-21, 2021-22 ਅਤੇ 2022-23 ਸੈਸ਼ਨ ਲਈ

ਸਮੈਸਟਰ ਦੂਜਾ

ਕੁਲ ਅੰਕ : 100

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ : 25 ਅੰਕ

ਬਾਹਰੀ ਪਰੀਖਿਆ: 75 ਅੰਕ

ਸਮਾਂ : 3 ਘੰਟੇ

ਵਿਸ਼ੇ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 35

ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 09

ਬਾਹਰੀ ਪਰੀਖਿਆ ਵਿਚੋਂ ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ : 26

(ਅਧਿਆਪਨ: 6 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

ਸਿਲੇਬਸ ਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਭਾਗ-ੳ-1: ਸਾਹਿਤਕ ਨਿਬੰਧ, ਲਲਿਤ ਨਿਬੰਧ, ਰੇਖਾ ਚਿੱਤਰ, ਸੰਸਮਰਣ (ਯਾਦਾਂ), ਡਾਇਰੀ ਦਾ ਸਰੂਪ, ਸਿਧਾਂਤ ਤੇ ਆਪਸੀ ਨਿਖੇੜਾ
(ਅਧਿਆਪਕ ਇਨ੍ਹਾਂ ਵਾਰਤਕ ਰੂਪਾਂ ਦੀ ਜਾਣ-ਪਛਾਣ ਕਰਵਾਏਗਾ, ਇਨ੍ਹਾਂ ਦੇ ਤੱਤਾਂ, ਲੱਛਣਾਂ ਅਤੇ ਆਪਸੀ ਵਖਰੇਵਿਆਂ ਬਾਰੇ ਦਿਆਰਥੀਆਂ ਨੂੰ ਜਾਣੂੰ ਕਰਵਾਏਗਾ। 12 ਅੰਕ

ਭਾਗ ੳ-2: ਸੂਰਜ ਮੰਦਰ ਦੀਆਂ ਪੇਂਟੀਆਂ (ਸੁਰਜੀਤ ਪਾਤਰ), ਲੋਕਗੀਤ ਪ੍ਰਕਾਸ਼ਨ, ਚੰਡੀਗੜ੍ਹ
(ਅਧਿਆਪਕ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਨਿਬੰਧ ਵਿਚਲੇ ਭਾਵਾਂ-ਵਿਚਾਰਾਂ ਅਤੇ ਨਿਬੰਧ ਦੀ ਸਾਹਿਤਕ ਕਲਾ ਤੇ ਲੇਖਕ ਦੀ ਭਾਸ਼ਾਈ ਮੁਹਾਰਤ ਬਾਰੇ ਜਾਣੂੰ ਕਰਵਾਏਗਾ ਅਤੇ ਨਾਲ ਹੀ ਉਨ੍ਹਾਂ ਨੂੰ ਇਨ੍ਹਾਂ ਬਾਰੇ ਆਪਣੇ ਵਿਚਾਰ ਬਨਾਉਣ ਅਤੇ ਆਪਣਾ ਸਿਰਜਣਾਤਮਕ ਹੁੰਗਾਰਾ ਸਿਰਜਣ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰੇਗਾ) 12 ਅੰਕ

ਭਾਗ-ਅ-1 ਕੋਸ਼: ਸਿਧਾਂਤ, ਸਰੂਪ ਅਤੇ ਵਰਤੋਂ: ਹੇਠ ਲਿਖੇ ਕੋਸ਼ਾਂ ਦੇ ਸਰੂਪ, ਇਨ੍ਹਾਂ ਵਿਚਲੇ ਨਿਖੇੜੇ ਬਾਰੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀ ਵਰਤੋਂ ਬਾਰੇ ਸਿਖਲਾਈ ਦਿੱਤੀ ਜਾਵੇਗੀ। ਅਧਿਆਪਕ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਵੱਖ ਵੱਖ ਤਰ੍ਹਾਂ ਦੇ ਕੋਸ਼ਾਂ ਦੇ ਸਰੂਪ, ਉਨ੍ਹਾਂ ਵਿਚਲੀ ਵਿਉਂਤ; ਵਿਸ਼ਾ ਪਾਸਾਰ, ਮਕਸਦ, ਵਰਤੋਂ, ਵਰਤੋਂ ਵਿਧੀ ਬਾਰੇ ਜਾਣਕਾਰੀ ਦੇਵੇਗਾ)

1) ਵਿਸ਼ਵਕੋਸ਼ 2) ਦੇ ਭਾਸ਼ਾਈ ਸ਼ਬਦ ਕੋਸ਼ 3) ਵਿਸ਼ਾ ਕੋਸ਼ 4) ਸਮਭਾਸ਼ੀ ਕੋਸ਼ 5) ਤਕਨੀਕੀ ਸ਼ਬਦਾਵਲੀ ਕੋਸ਼ 6) ਵਿਕੀਪੀਡੀਆ 12 ਅੰਕ

ਭਾਗ ਅ-2: ਅਖ਼ਬਾਰ ਲਈ ਪ੍ਰੈੱਸ ਰਿਪੋਰਟ (ਕਿਸੇ ਸਾਹਿਤਕ, ਸਭਿਆਚਾਰਕ, ਅਕਾਦਮਿਕ ਸਮਾਗਮ, ਕਾਨਫਰੰਸ ਜਾਂ ਸੈਮੀਨਾਰ ਦੀ ਪ੍ਰੈੱਸ ਰਿਪੋਰਟ ਲਿਖਣ ਦੀ ਸਿਖਲਾਈ) ਇਸ ਵਿਚ ਅਧਿਆਪਕ ਵੱਖ ਵੱਖ ਤਰ੍ਹਾਂ ਦੇ ਆਯੋਜਨਾਂ ਬਾਰੇ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਜਾਣੂੰ ਕਰਵਾਏਗਾ ਅਤੇ ਇਨ੍ਹਾਂ ਸਮਾਗਮਾਂ ਵਿਚਲੇ ਅੰਤਰ ਨੂੰ ਸਪਸ਼ਟ ਕਰੇਗਾ ਤਾਂ ਕਿ ਵਿਦਿਆਰਥੀ ਉਨ੍ਹਾਂ ਦੀ ਕਲਪਨਾ ਕਰ ਸਕਣ। ਅਧਿਆਪਕ ਇਨ੍ਹਾਂ ਆਯੋਜਨਾਂ ਵਿਚ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸ਼ਾਮਿਲ ਹੋਣ ਲਈ ਉਤਸਾਹਿਤ ਕਰੇਗਾ ਅਤੇ ਉਨ੍ਹਾਂ ਆਪਣੀ ਵਿਚ ਅਗਵਾਈ ਵਿਚ ਇਨ੍ਹਾਂ ਆਯੋਜਨਾਂ ਵਿਚ ਲੈ ਕੇ ਜਾਵੇਗਾ। 9 ਅੰਕ

(ਅੰਦਰੂਨੀ ਮੁਲਾਂਕਣ ਲਈ ਅਸਾਈਨਮੈਂਟ ਦਾ ਕਾਰਜ ਪਾਠਕ੍ਰਮ ਦੇ ਇਸ ਭਾਗ ਨਾਲ ਸੰਬੰਧਿਤ ਕਰਵਾਇਆ ਜਾਵੇਗਾ। ਵਿਦਿਆਰਥੀ ਇੱਕ ਸਕਰੈਪ ਬੁੱਕ ਤਿਆਰ ਕਰੇਗਾ ਜਿਸ ਵਿਚ ਉਹ ਪੰਜਾਬੀ ਭਾਸ਼ਾ, ਸਾਹਿਤ, ਸਭਿਆਚਾਰ, ਲੋਕਧਾਰਾ ਤੋਂ ਇਲਾਵਾ ਆਪਣੇ ਹੋਰ ਅਧਿਐਨ ਵਿਸ਼ਿਆਂ ਨਾਲ ਸੰਬੰਧਿਤ ਉਪਲਬਧ ਕੋਸ਼ੀ ਇੰਦਰਾਜ਼ ਚਿਪਕਾਏਗਾ ਅਤੇ ਜਿੱਥੋਂ ਤਕ ਸੰਭਵ ਹੋਵੇ ਖੁਦ ਇੰਦਰਾਜ਼ ਤਿਆਰ ਕਰੇਗਾ। ਅਧਿਆਪਕ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਖੁਦ ਇੰਦਰਾਜ਼ ਤਿਆਰ ਕਰਨ ਲਈ ਉਤਸਾਹਿਤ ਕਰਨਗੇ। ਉਪਰੋਕਤ ਵੱਖ ਵੱਖ ਤਰ੍ਹਾਂ ਦੇ ਕੋਸ਼ਾਂ ਵਿਚੋਂ ਹਰ ਇੱਕ ਦੀਆਂ ਘੱਟ ਤੋਂ ਘੱਟ 4 ਇੰਦਰਾਜ਼ ਸਕਰੈਪ ਬੁੱਕ ਵਿਚ ਚਿਪਕਾਏ/ਲਿਖੇ ਜਾਣਗੇ)

ਭਾਗ-ੲ ਉਪਰੋਕਤ ਪਾਠਕ੍ਰਮ ਤੇ ਅਧਾਰਤ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ ਪ੍ਰਸ਼ਨ। 30 ਅੰਕ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈੱਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਪਾਠਕ੍ਰਮ ਦੇ ਦੋ ਭਾਗ ੳ ਅਤੇ ਅ ਹਨ ਪਰ ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਤਿੰਨ ਭਾਗ ੳ, ਅ ਅਤੇ ੲ ਹੋਣਗੇ।
2. ਪੇਪਰ ਨੂੰ ਤਿੰਨ ਭਾਗਾਂ ੳ, ਅ ਅਤੇ ੲ ਵਿੱਚ ਵੰਡਿਆ ਜਾਵੇਗਾ।
3. ਭਾਗ ੳ-1 ਵਿਚ ਵਿਚੋਂ ਵਾਰਤਕ ਰੂਪਾਂ ਦੇ ਸਰੂਪ ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ ਆਪਸੀ ਨਿਖੇੜੇ ਬਾਰੇ ਦੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀ ਨੇ ਦੋਵਾਂ ਵਿਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਦਾ ਵਿਸਤ੍ਰਿਤ ਉੱਤਰ ਦੇਣਾ ਹੋਵੇਗਾ। 12 ਅੰਕ

4. ਭਾਗ ਓ-2 ਵਿਚ ਲਗਾਈ ਗਈ ਪਾਠ ਪੁਸਤਕ ਵਿੱਚੋਂ ਕਿਸੇ ਇਕ ਨਿਬੰਧ ਦਾ ਵਿਸ਼ਾ/ਸਾਰ/ ਨਿਬੰਧ ਵਿਚਲੇ ਵਿਚਾਰਾਂ ਬਾਰੇ ਪਾਠਕ ਦਾ ਹੁੰਗਾਰਾ (ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 12 ਅੰਕ

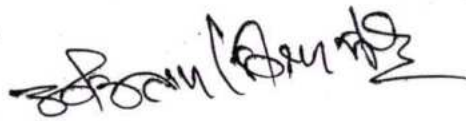
4. ਭਾਗ ਅ-1: ਵਿੱਚੋਂ ਤਿੰਨ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ਅਤੇ ਵਿਦਿਆਰਥੀ ਨੇ ਤਿੰਨਾਂ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਹੋਵੇਗਾ। ਇਹ ਪ੍ਰਸ਼ਨ ਵੱਖ ਵੱਖ ਤਰ੍ਹਾਂ ਦੇ ਕੇਸ਼ਾਂ ਦੇ ਸਰੂਪ, ਉਨ੍ਹਾਂ ਵਿਚਲੀ ਵਿਉਂਤ, ਵਿਸ਼ਾ ਪਾਸਾਰ, ਮਕਸਦ, ਵਰਤੋਂ, ਵਰਤੋਂ ਵਿਧੀ ਬਾਰੇ ਹੋਣਗੇ। 12 ਅੰਕ

5 ਅ-2 ਦਰਸਾਏ ਵਿਸ਼ਿਆਂ ਵਿੱਚੋਂ ਕਿਸੇ ਵਿਸ਼ੇ 'ਤੇ ਕੋਈ ਕਾਲਪਨਿਕ ਆਯੋਜਨ ਦਾ ਵੇਰਵਾ ਦੇ ਕੇ ਪ੍ਰੈੱਸ ਰਿਪੋਰਟ ਲਿਖਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। (ਤਿੰਨ ਵਿੱਚੋਂ ਇੱਕ) 09 ਅੰਕ

6.. ਭਾਗ-ੲ ਵਿਚ ਪਾਠਕ੍ਰਮ ਦੇ ਭਾਗ ਓ ਦੇ ਦੋਵੇਂ ਭਾਗਾਂ ਅਤੇ ਭਾਗ ਅ-1 (ਕੇਸ਼ ਸਿਧਾਂਤ ਸਰੂਪ ਤੇ ਵਰਤੋਂ) ਵਾਲੇ ਭਾਗ ਵਿੱਚੋਂ ਸੰਖੇਪ ਉੱਤਰਾਂ ਵਾਲੇ 15 (ਭਾਗ ਓ ਵਿੱਚੋਂ 10 ਅਤੇ ਭਾਗ ਅ-2 ਵਿੱਚੋਂ 5) ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ। ਵਿਦਿਆਰਥੀ ਨੇ ਸਾਰੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਸੰਖੇਪ ਉੱਤਰ ਦੇਣੇ ਹੋਣਗੇ। ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 2 ਅੰਕ ਹੋਣਗੇ। 15x2=30 ਅੰਕ

ਸਹਾਇਕ ਪਾਠ-ਸਮੱਗਰੀ

1. ਰਾਜਿੰਦਰਪਾਲ ਸਿੰਘ, ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਾਹਿਤ ਰੂਪਾਕਾਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ
2. ਅਬਨਾਸ ਕੌਰ, ਪੰਜਾਬੀ ਰੇਖਾ ਚਿੱਤਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ
3. ਸਤਿੰਦਰ ਸਿੰਘ, ਵਿਹਾਰਕ ਸਮੀਖਿਆ: ਕਵਿਤਾ ਤੇ ਵਾਰਤਕ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ
4. ਪਰਮਿੰਦਰ ਸਿੰਘ, ਸਾਹਿਤ ਦੇ ਰੂਪ, ਲਹੌਰ ਬੁੱਕ ਸ਼ਾਪ, ਲੁਧਿਆਣਾ





**OUTLINE FOR THE SYLLABUS OF A MODULE ON
DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION**

Session: 2016-17, 2017-18 & 2018-19

Continued for Sessions 2019-2020, 2020-2021 & 2021-2022

(FOR ALL UNDERGRADUATE COURSES)

Note: This is a compulsory qualifying paper, which the students have to study and qualify during three years of their degree course.

REGULAR STUDENTS

Max Marks: 70

Max Time: 3hrs.

Internal Assessment: 30

Total Marks 100

Lectures per week 5

INSTRUCTIONS FOR THE PAPER SETTERS

The question paper will consist of three sections A, B and C. Each of sections A and B will have four questions from the respective sections of the syllabus. Each question shall carry 7 marks. Section C will consist of 14 short answer type of 2 marks each.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any three questions from section A and any three questions from section B. Section C is compulsory.

PRIVATE/DISTANCE EDUCATION STUDENTS

Max Marks: 100

Max Time: 3hrs.

Lectures per week 5

INSTRUCTIONS FOR THE PAPER SETTERS

The question paper will consist of three sections A, B and C. Each of sections A and B will have three questions from the respective sections of the syllabus. Each question shall carry 15 marks. Section C will consist of 20 short answer type of 2 marks each.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any two questions from section A and any two questions from section B. Section C is compulsory.

SECTION A

UNIT: I – Problem of Drug Abuse: Concept and Overview; Types of Drug Often Abused

(a) Concept and Overview

What are drugs and what constitutes Drug Abuse?

Prevalence of menace of Drug Abuse

How drug Abuse is different from Drug Dependence and Drug Addiction?

Physical and psychological dependence- concepts of drug tolerance

(b) Introduction to drugs of abuse: Short Term, Long term effects & withdrawal symptoms

Stimulants: Amphetamines, Cocaine, Nicotine

Depressants: Alcohol, Barbiturates- Nembutal, Seconal, Phenobarbital Benzodiazepines
–Diazepam, Alprazolam, Flunitrazepam

Narcotics: Opium, morphine, heroin

Hallucinogens: Cannabis & derivatives (marijuana, hashish, hash oil)

Steroids

Inhalants

UNIT: II –Nature of the Problem

Vulnerable Age Groups

Signs and symptoms of Drug Abuse

(a)- Physical indicators

(b)- Academic indicators

(c)- Behavioral and Psychological indicators

SECTION B

UNIT: III – Causes and Consequences of Drug Abuse

a) Causes

Physiological

Psychological

Sociological

b) Consequences of Drug Abuse

For individuals

For families

For society & Nation

Unit: IV- Management & Prevention of Drug Abuse

Management of Drug Abuse

Prevention of Drug Abuse

Role of Family, School, Media, Legislation & Deaddiction Centers

Suggested readings

1. Kapoor.T. (1985) Drug Epidemic among Indian Youth, New Delhi: Mittal Pub
2. Modi, Ishwar and Modi, Shalini (1997) Drugs: Addiction and Prevention, Jaipur: Rawat Publication.
3. Ahuja, Ram, (2003), Social Problems in India, Rawat Publications: Jaipur
4. 2003 National Household Survey of Alcohol and Drug Abuse. New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
5. World Drug Report 2011, United Nations Office of Drug and Crime.
6. World Drug Report 2010, United Nations Office of Drug and Crime.
7. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
8. The Narcotic Drugs and Psychotropic Substances Act, 1985, (New Delhi: Universal, 2012)

Pedagogy of the Course Work:

The pedagogy of the course work will consist of the following:

70% lectures (including expert lectures).

30% assignments, discussion and seminars and class tests.

Note: A visit to drug de-addiction centre could also be undertaken.