

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allo ted Cred its |
|---------------------|-----------------------------|--------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Total Mark s | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Marks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| HBHL1 01 | Hindi Language Structure -I | 5 0 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain Indian cultural

Describe Hindi language

Brief a Hindi grammer

Syllabus

इकाई-1

भारत वंदना (काव्य)

जाग तुझको दूर जाना

स्वतंत्रता पुकारती (काव्य)

हम अनिकेतन (काव्य)

भाषा की महत्ता और उसके विविध रूप

सूर्यकांत त्रिपाठी 'निराला'

सुश्री महादेवी वर्मा

जयशंकर 'प्रसाद'

बालकृष्ण शर्मा 'नवीन'

भाषा-कौशल

इकाई-2

करुणा (निबंध)

समन्वय की प्रक्रिया (निबंध)

बिच्छी बुआ (कहानी)

अनुवाद

हिन्दी की शब्द-संपदा

परिभाषिक शब्दावली

आचार्य रामचन्द्र शुक्ल

रामधारी सिंह 'दिनकर'

डॉ. लक्ष्मण विष्ट 'बटरोही'

परिभाषा प्रकार, महत्व, विशेषताएं

इकाई-3

विलायत पहुंच ही गया (आत्मकथांश)

अफसर (व्यंग्य)

तीर्थयात्रा (कहानी)

मकड़ी का जाला (व्यंग्य)

वाक्य-संरचन:तत्सम, तद्भव देशज विदेशी

महात्मा गांधी

शरद जोषी

डॉ. मिथिलेश कुमार मिश्र

डॉ. रामप्रकाश सक्सेना

इकाई-4

अप्प दीपो भव (वक्तृत्व कला)

भारत का सामाजिक व्यक्तित्व (प्रस्तावना)

पत्र मैसूर के महाराजा को (पत्र-लेखन)

बनी रहेंगी किताबें (आलेख)

पत्र-लेखन:महत्व और उसके विविध रूप

सड़क पर दौड़ते ईहा मृंग (निबंध)

स्वामी श्रद्धानंद

जवाहरलाल नेहरू

स्वामी विवेकानंद

डॉ. सुनीता रानी घोष

डॉ. श्यामसुन्दर दुबे

इकाई-5

योग की शक्ति (डायरी)

कोश के अखाड़े में कोई पहलवान नहीं उतरता(साक्षात्कार)

नीग्रो सैनिक से भेंट (यात्रा-संस्मरण)

यदि बा न होती तो शायद गांधी को

यह ऊँचाई न मिलती (साक्षात्कार) 5 कथाकार

सर-लेखन, भाव-पल्लवन साक्षात्कार और कौशल

डॉ. हरिवंशराय बच्चन

भाषाविद् डॉ. हरदेव बाहरी से प्रो.त्रिभुवननाथ शुक्ल

डॉ. देवेन्द्र सत्यार्थी

गिरिराज किशोर से सत्येन्द्र शर्मा

Outcome

To able to understand our cultural

To able to understand language

To able to understand hindi Grammer

Reference books

Hindi Grantham Akadmi

(Board of studies)

(Academic Council)

(Registrar)

Seal

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| Theory group | | | | | | | | | | | | |
| MBED1 01 | Fundamentals of Entrepreneurship- I | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the importance of Entrepreneurship

Explained how to achieve a target , establishment of ideas, & facing a challenges

Briefed about a project & report writing.

Briefed about a production management

Explain the importance of Role of regulatory institutions

Syllabus

Unit-I

Entrepreneurship-

Definition, Characteristics and importance, Types and functions of an entrepreneur, merits of a good entrepreneur motivational factors of entrepreneurship.

Unit-II

Motivation to achieve targets and establishment of ideas. Setting targets and facing challenges. Resolving problems and creativity. Sequenced planning and guiding capacity, Development of self confidence. Communication skills, Capacity to influence, leadership.

Unit-III

Project Report- Evaluation of selected process. Detailed project report - Preparation of main part of project report pointing out necessary and viability.

Selecting the form of Organization: Meaning and characteristics of sole Proprietorship, Partnership and cooperative committees, elements affecting selection of a form of an organization.

Economic management -Role of banks and financial institutions banking, financial plans, working capital-evaluation and management, keeping of accounts.

Unit IV

Production management - Methods of purchase. Management of movable assets/goods. Quality management. Employee management. Packing.

Marketing management Sales and the art of selling. Understanding the market and market policy. Consumer management. Time management.

Unit-V

Role of regulatory institutions - district industry centre, pollution control board, food and drug administration, special study of electricity development and municipal corporation.

Role of development organizations, khadi & village Commission/ Board, State Finance Corporation, scheduled banks, MP Women's Economics Development Corporation.

Self-employment-oriented schemes, Prime Minister's Employment schemes, Golden Jubilee Urban environment scheme, Rani Durgavati Self-Employment scheme, Pt. Deendayal Self- employment scheme.

Various grant schemes - Cost-of-Capital grant, interest grant, exemption from entry tax, project report, reimbursement grant, etc.

Special incentives for women entrepreneurs, prospects & possibilities.

Schemes of Tribal Finance Development Corporation, schemes of Antyavasai Corporation, schemes of Backward Class and Minorities Finance Development Corporation.

Outcome

To be able to understand Entrepreneurship

To be able to understand achieve a target , establishment of ideas, & facing a challenges

To be able to write a project & report writing.

To be able to use production management

To be able to understand Role of regulatory institutions

Reference Books:

1. Entrepreneurship Development- Dr.U.C.Gupta and Satish Kumar-Kailash Pustak Sadan
2. Entrepreneurship Development- Satish Kumar
3. Fundamental of Entrepreneurship : Sangram Kesari Mohanty (PHI Publications)
4. Udhyaamita Vikas : U.C Gupta (Kailash Prakashan)
5. Entrepreneurship Development D. Acharya (Himalaya Publication House)

(Board of studies)

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| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH1 03 | Physics-I (Mechanics, Oscillations and properties of matter) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

To understand the kinematics and dynamics of a particle a get insight of system of particles, rotational and oscillations. To know about the fluid mechanics and motion of charge particle

Syllabus

Unit-1

Mechanics: Laws of motion, motion in a uniform field, components of velocity and acceleration in different coordinate systems. Uniformly rotating frame, centripetal acceleration, Coriolis force and its applications. Motion under a central force, Kepler's laws.

Gravitational law and field,. Potential due to a spherical body, Gauss & Poission's Equation of Gravitational self-energy System of. particles,, centre, of mass, equation of motion, conservation of linear and angular, momentum, conservation of energy, single stage and multistage rockets, elastic and inelastic collisions.

Unit-2

Oscillations: Potential well and. periodic oscillations, case of harmonic oscillations, differential equation and its solution, kinetic and potential energy, simple harmonic oscillations and its examples, spring and mass system, Vibrations of a magnet, oscillations of two masses connected by a spring.

Rigid Body Motion rotational motion, moments of inertia and their products, principal moments and axes, Euler's equations simple and compound pendulum tensional pendulum, bifilar oscillations, Helmholtz resonator, LC circuit.

Unit-3 Superposition Of Harmonic Motion : Superposition of two simple harmonic motions of the same frequency along the same line, interference, superposition of two mutually perpendicular simple harmonic vibrations of the same frequency, Lissajous figures, case of different frequencies. Two coupled oscillators, normal modes, N coupled oscillators, damped harmonic oscillators, power dissipation, quality factor and their examples, driven harmonic oscillator; transient and steady states, power absorption, resonance in systems with many degrees of freedom.

Unit-4 Properties of matter: Elasticity, small deformations, Hook's Law, elastic constants for an isotropic solid, beams supported at both the ends, cantilever, torsion of a cylinder bending moments and shearing forces. Kinematics of moving fluids, equations of continuity Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow, Poiseuille's law, Capillary tube flow, Reynold's number, Stokes law Surface tension and surface energy molecular interpretation of surface tension, pressure on a curved liquid surface wetting.

Unit-5 Motion of charged Particles in Electric and Magnetic Fields : (note : The emphasis here should be on the mechanical aspects and not on the details of the apparatus mentioned which are indicated as applications of principles involved.) E as an accelerating field, electron gun, case of discharge tube, linear accelerator. E as deflecting field- CRO, sensitivity of CRO. Transverse B field; 180° deflection, mass spectrograph or velocity selector curvatures of tracks for energy determination for nuclear particles; principles of a cyclotron. Mutually perpendicular E and E fields- velocity selector, its resolution. Parallel E and B fields; positive ray parabolas, discovery of isotopes, elements of mass spectrographs, principle of magnetic focusing (lenses).

PRACTICAL WORK: PHYSICS-I

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distribution | | | Allotted Credits |
|---------------------|--|-------------|-------------------|-----------|-----------|-----------|-------------------|-----------|---------------------|---|---|---------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distribution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH103 | Physics-I (Mechanics, Oscillations and properties of matter) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

PRACTICAL AND MARKS DISTRIBUTION

1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Study of a compound pendulum.
3. Study of damping of a bar pendulum under various mechanics.

4. Study of oscillations under a bifilar suspension.
5. Study of bending of a cantilever or a beam.
6. Study of torsion of a wire (static and dynamic methods)
7. Study of conservation of momentum in two dimensional oscillations.
8. Potential energy curves of a 1-Double system and oscillations in it for Various amplitudes.
9. Study of oscillations of mass under different combinations of springs.
10. Study of flow of liquids through capillaries.
11. Determination of surface tension of a liquid by different methods.
12. Study of viscosity of a fluid by methods

Outcome:

At the end of this course, the students will be able to solve mechanics, dynamics and kinematics of the system of particles. They will get knowledge about gravitation and rotational motions.

(Board of studies)

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| Theory group | | | | | | | | | | | | |
| SBCH1 04 | Chemistry_I (Inorganic and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

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Objective:

- Use molecular orbital theory to explain differences among second row diatomic molecules
- Appreciate the role of nonbonding interactions, in particular with respect to solubilities.
- Use quantum mechanical descriptions for electronic orbitals and molecular symmetry principles
- To describe chemical bonding.
- Use valence shell repulsion theory to predict shapes of symmetric molecules.

Syllabus

Unit I

Mathematical Concepts : Logarithmic relations, curves stretching, linear graphs and calculation of slopes, Differentiation of functions like Kx , ex , xn , $\sin x$, $\log x$; maxima and minima, partial differentiation and reciprocity relations. Integration of some useful/relevant functions; permutations and combinations. Factorials, Probability. B. Gaseous States : Deviation from ideal behaviour, van der Waals equation of state. Critical phenomenon : PV isotherms of ideal gases, continuity of states, the isotherms of van der Waals equations,

relationship between critical constants and van der Waals constants, the law of corresponding states, reduced equation of states. C. Molecular Velocities : Root mean square, average and most probable velocities. Qualitative discussion of the Maxwell's distribution of molecular velocities, collision numbers, mean free path and collision diameter. Liquefaction of gases (based on Joule-Thomson effect).

Unit II

Liquid State : Intermolecular forces, structure of liquids (a qualitative description) Liquid crystals: Difference between liquid crystal, solid and liquid. Classification, structure of nematic and cholestric phases. Thermography and seven segment cell.

Colloidal State : Definition of colloids, classification of colloids. Solids in liquids (sols): properties- kinetic, optical and electrical; stability of colloids, protective action, Hardy-Schulze law, gold number. Liquids in liquids (emulsions) : types of emulsions, preparation. Emulsifier. Liquids in solids (gels): classification, preparation and properties, inhibition, general applications of colloids.

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

Unit III

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

Experimental methods of chemical kinetics - conductometric, potentiometric, optical methods- polarimetry and spectrophotometry. 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.

Unit IV

A. Structure and Bonding : Hybridizations, Bond lengths and bond angles, bond energy : Localized and delocalized chemical bond, van-der Waals interactions, inclusion compounds, clathrates, charge transfer complexes, resonance, hyperconjugation, aromaticity, inductive and field effects, hydrogen bonding.

B. Mechanism of Organic reactions : Curved arrow notations, drawing electron movements with arrows, half-headed and double headed arrows, homolytic and heterolytic bond breaking.

C. Types of Reagents : Electrophiles and nucleophiles. Types of organic reactions. Energy consideration. Reactive intermediates- carbocations, carbanions, free radicals and carbenes. Methods of determination of reaction mechanism.

Unit V

Stereochemistry : Concept of isomerism, types of isomerism, optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centres, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogenic centres, diastereomers, mesocompounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configurations, sequence rule, D & L , R & S systems of nomenclature. E and Z system of Nomenclature geometrical isomerism in alicyclic compounds. Conformation, conformational analysis of ethane and n-butane. Conformations of cyclohexanes, axial and equatorial bonds, Newman projection and Sawhorse formulae, Fischer and Flying wedge formulae. B. Alkanes and Cycloalkanes : IUPAC nomenclature, classification, isomerism in alkanes, sources and methods of preparation (with special reference to Wurtz, Kolbe, Corey-House reactions and decarboxylation of carboxylic acids). Physical properties and chemical reactions of alkanes. Mechanism of free radical halogenation of alkanes Cycloalkanes : nomenclature, methods of preparations, chemical reactions. Baeyer's strain theory and its limitations. ring strain in cyclopropane and cyclobutanes. Theory of strainless rings.

Outcome:

- Upon successful completion of this course, students will understand theories of chemical bonding and determine the molecular geometry of molecules using VSEPR theory.
- Identify types of chemical bonds.
- Know theories of chemical bonding and the forces that influence molecular shapes.

(Board of studies)

(Academic Council)

(Registrar)

Seal

Practical –Chemistry

Class: B.Sc. Semester I

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
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| Theory group | | | | | | | | | | | | |
| SBCH1 04 | Chemistry -I (Inorganic and Organic chemistry) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

Duration of practical's during the entire semester: 90 hours

Duration of practical during the semester examination: 4 hour

Physical Chemistry

A. (Any one experiment will be asked in examination form the following carrying 12 Marks)

1. Calibration of thermometer
2. Determination of melting point
3. Determination of boiling point
4. Determination of mixed melting point
5. Preparation of solutions of various concentrations, NaOH, HCl, H₂SO₄.

B. (Any one experiment will be asked in examination form the following carrying 12 Marks)

1. To determine the velocity constant (specific reaction rate) of 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. To compare the strength of HCl and H₂SO₄ by studying the kinetics of hydrolysis of ester.
4. To study kinetically the reaction rate of decomposition of iodide by H₂O₂.
5. Determination of surface tension / percentage composition of given organic mixture using surface tension method.
6. Determination of viscosity / percentage composition of given organic mixture using viscosity method.

Organic chemistry

(Any one experiment will be asked in examination form the following carrying 12 Marks)

1. Distillation
2. Crystallization
3. Decolourisation and crystallization using charcoal
4. Sublimation

Viva: 6 marks

Records: 8 marks

Reference Books:

1. Unified Chemistry M. N. Tondan B.Sc. I SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. I Year
3. Yugbodh Unified Chemistry B.Sc. I SEM
4. Yugbodh Unified Practical Chemistry B.Sc. I Year
5. Mathematics : Agrawal
6. Organic Chemistry By Morrison Robert

7. Practical Chemistry : Vogel

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| Theory group | | | | | | | | | | | | |
| SBMA1 05 | Mathematics-I Algebra, Trigonometry & Geometry | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

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Objective

Explain the method of Application of Matrix in linear equation

Describe the method of De Moivre's theorem and its application

Explain the application of group theory

Explain general equation of second degree by cone , cylinder , conicoids.

Syllabus

Unit-1

Rank of a matrix. Eigen values, eigen vectors.Characteristic equation of a matrix. Cayley Hamilton theorem and its use in finding inverse of marix. Application of matrix to a system of linear (both homogenous and non - homogenous) equations. Theorems on consistency and inconsistency of a system of linear equations. Solving the linear equations with three

unknowns. Relation between the roots and coefficients of a general polynomial equation in one variable. Transformation of equations, Descarte's rule of signs.

Unit-2

De Moivre's theorem and its application. Direct and inverse circular and hyperbolic functions, Expansion of trigonometrical function. Gregory's Series, Summation of Series,

Unit-3

Definition and basic properties of group. Order of an element of a group. Subgroups, algebra of subgroups. Cyclic groups and their simple properties. Coset decomposition and related theorems. Lagrange's theorem and its consequences, Normal sub groups, quotient groups.

Unit-4

Homomorphism and isomorphism of groups, kernel of Homomorphism and fundamental theorem of Homomorphism of groups Permutation groups (even and odd permutations) Alternating groups A_n , Cayley's theorem. Introduction to rings, subrings, integral domains and fields, simple properties and examples.

Unit-5 General equation of second degree. Tracing of conics. Equation of cone with given base, generators of cone, condition for three mutually perpendicular generators, Right circular cone. Equation of Cylinder and its properties. Right circular cylinder, enveloping cylinder and their properties Central conicoids, Paraboloids. Plane sections of Conicoids.

Outcome

To able to understand method of Application of Matrix in linear equation

To be able to understand of De Moivre's theorem and its application

To be able to understand application of group theory

To be able to understand general equation of second degree by cone, cylinder & coincoinds.

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| Theory group | | | | | | | | | | | | |
| HBEL2 01 | English Language Structure -I | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

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Syllabus

OBJECTIVE

EXPLAIN Comprehension

EXPLAIN COMPOSITION AND PARAGRAPH WRITING

EXPLAIN USES OF GRAMMER

UNIT – I

1. Amalkanti : Nirendranath Chakrabarti
2. Sita : Toru Dutt
3. Tryst with Destiny : Jawaharlala Nehru
4. Delhi in 1857 : Mirza Ghalib
5. Preface to the Mahabharata : C., Rajagopalachari
6. Where the Mind is Without Fear : Rabindranath Tagore
7. A Song of Kabir : Translated by Tagore
8. Satyagraha : M.K. Gandhi
9. Toasted English : R.K. Narayan
10. The Portrait of a Lady : Khushwant Singh
11. Discovering Babasaheb : Ashok Mahadevan

Unit – II

Comprehension

Unit – III

Composition and Paragraph Writing (Based on expansion of an idea).

Unit – IV

Basic Language Skills : Vocabulary – Synonyms, Antonyms, Word Formation, Prefixes and Suffixes, Words likely to be confused and Misused, Words similar in Meaning or Form, Distinction between Similar Expressions, Speech Skills.

Unit – V

Basic Language Skills : Grammar and usage – The Tense Forms, Propositions, Determiners and Countable/Uncountable Nouns, Verb, Articles, Adverbs.

Outcome

To be able to understand Comprehension

TO BE ABLE TO UNDERSTAND COMPOSITION AND PARAGRAPH WRITING

TO BE ABLE TO UNDERSTAND GRAMMER

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|-----------------------------------|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subject Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| MBED2 02 | Development of Entrepreneur II | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain Characteristics of entrepreneur.

Explain types of entrepreneurship

Explain Management skills of the entrepreneur.

Explain Problems and Scope of the Entrepreneur

Syllabus

Unit – I

Entrepreneurship – Meaning, Concept, Characteristics of entrepreneur.

Unit – II

Types of entrepreneurship, importance and views of various thinkers (Scholars).

- Formation of goals, How to achieve goals.
- Problems in achieving targets and solution.
- Self motivation, elements of self motivation and development
- Views of various scholars, evaluation, solutions.

Leadership capacity: Its development and results.

Unit – III

Projects and various organizations (Govt., non-Govt), Govt. Projects, Non-Govt.projects.

Contribution of Banks, their limitations, scope.

Unit – IV

Functions, qualities, management of a good entrepreneur.

Qualities of the entrepreneur (Modern and traditional).

Management skills of the entrepreneur.

Motive factors of the entrepreneur

Unit – V

Problems and Scope of the Entrepreneur:

- Problem of Capital
- Problem of Power
- Problem of registration
- Administrative problems
- Problems of Ownership.

Outcome

To be able to understand Characteristics of entrepreneur.

To be able to understand types of entrepreneurship

To be able to understand Management skills of the entrepreneur.

To be able to understand Scope of the Entrepreneur

Reference Books:

1. Entrepreneurship Development-Dr.U.C.Gupta and Satish Kumar-Kailash Pustak Sadan
2. Entrepreneurship Development- Satish Kumar.

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH2 03 | Physics-II (Mathematical Background, Electrostatics, and Steady Currents) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

To understand the mathematical background of vector calculus, electrostatics and magneto statics of the particle. the student will be able to understand electromagnetism and electrodynamics

Syllabus

Unit-1 Mathematical Background

Scalars and vectors, dot and cross products, triple vector product, gradient of scalar field and its geometrical Interpretation divergence and curl of a vector field, line, surface and volume integrals, flux of a vector field, Gauss's divergence theorem. Green's theorem and Stoke's theorem.

Functions of two and three variables, partial derivatives, geometrical interpretation of partial derivatives of functions of two variables. Total differential of a function of two and three variables, higher order derivative, and, it's, applications.

Repeated integrals of a function of more than one variable, definition of a double and triple integral ,evaluation of double and triple integrals as repeated integrals, change of variables of integration, Jacobian applications.

Unit-2 Electrostatics

Coulombs law in vacuum expressed in vector forms, calculations of E for simple distributions of charge at rest, dipole and quadrupole fields. Work done on a charge in an electrostatic field expressed as a line Integral, conservative nature of the electrostatic field. Electric potential $E = -\tilde{N}$, torque on a dipole in a uniform electric field and its energy, flux of the electric field, Gauss's law and its application for finding E for symmetric charge distributions, Gaussian pillbox, fields at a surface of a conductor, screening of E field by a conductor. Capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field, point charge in front of a grounded infinite conductor. Dielectrics, parallel plate capacitor with a dielectric, dielectric constant, polarization and polarization vector, and displacement vector D, molecular interpretation of Clausius-Mossotti equation, boundary conditions satisfied by E and D at the interface between two homogenous : Dielectrics, illustration through a simple example.

Unit-3 Electric Currents

Steady current, current density J, non-steady currents and continuity equation, Kirchoff 's laws and analysis of multiloop circuits, rise and decay of current in LR and CR circuits, decay constants, transients in LCR circuits. AC circuits, complex numbers and their applications solving AC circuits Problems, complex impedance and reactance, series and parallel resonance., Q factor, power consumed by an A.C. circuit, power factor, Y and A networks and transmission of electric power.

Unit-4 Magnetostatics: Force on a moving charge: Lorentz force equation and definition of B, force on a straight conductor carrying current in a uniform magnetic field, torque on a current loop, magnetic dipole moment, angular momentum and gyromagnetic ratio, Biot and Savart's Law, calculation of H for simple geometrical situations, Ampere's Law, $\tilde{N} \times B = \mu_0 J$, $\tilde{N} \cdot B = Q$; Field due to a magnetic dipole magnetization current magnetization vector, Half order field, magnetic permeability (linear cases), interpretation of a bar magnet as i surface distribution of solenoidal current.

Unit-5 Time Varying Fields : Electromagnetic induction, Faraday's Laws, electromotive force $e = E \cdot dl$, integral and differential forms of Faraday's laws. self and mutual inductance transformers, energy in a static magnetic field. Maxwell's displacement current, Derivations of Maxwell's equations, electromagnetic field energy density., Poynting's vector. The wave equation satisfied by E and B, plane electromagnetic waves in vacuum, reflection at a plane boundary of dielectrics, polarization by reflection and total internal reflection. Faraday effect, waves in a conducting medium, reflection and refraction by the ionosphere.

PRACTICALS: PHYSICS-II

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|------------------|--------------|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|-------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |

| | | | | | | | | | | | | | butio n |
|---------------------|---|----|----|---|----|---|---|---|---|---|---|---|------------|
| Theory group | | | | | | | | | | | | | |
| SBPH2 03 | Physics-II (Mathematical Background, Electrostatics, and Steady Currents) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 | |

PRACTICALS

1. Characteristics of a ballistic galvanometer
2. Setting up and using an electroscope or electrometer.
3. Measurement of low resistance by Carey-Foster bridge or otherwise;
4. Measurement of inductance using impedance at different frequencies.
5. Measurement of capacitance using, impedance at different frequencies.
6. Response curve for LCR circuits and response frequencies.
7. Sensitivity of a cathode- ray oscilloscope
8. Use of a vibration magnetometer to study a field
9. Study of B field due to a current.
10. Study of decay of currents in LR and RC circuits.

Outcome:

At the end of this course, the student will be able to understand electromagnetism and electrodynamics. IT is beneficial for electrical engineering and electronics engineering.

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Crediti s |
|---------------------|--|----------------|-------------------|--------------|--------------|--------------|-------------------|--------------|----------------------------|---|---|-------------------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distri bution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH2 04 | Chemistry-II (Physical and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

- Sketch 1s, 2s and 2p atomic orbitals and combine them to interpret sp³, sp² and sp hybrid orbitals.
- Use a Periodic Chart to predict elemental and atomic properties, such as electronegativity, size, state of matter, likely reaction partners.
- Understand bond formation and bond energies, and predict which bonds are weak and which are strong.

Syllabus

Unit I

A. Atomic Structure : Idea of de Broglie's matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrödinger wave equation, significance of ψ and ψ^2 , quantum numbers, radial and angular wave functions and probability distribution curves, effective nuclear charge.

B. Periodic Properties : Atomic and ionic radii, ionization energy, electron affinity and electronegativity : definition, method of determination, trends in periodic table and applications.

C. Chemical Bonding : Covalent bond- valence bond theory and its limitations, directional characteristic of covalent bond. Hybridization and shapes of simple molecules and ions. Valence Shell Electron Pair Repulsion (VSEPR) theory to NH₃, SF₄, ClF₃, ICl₂ - and H₂O.

Unit II

A. Molecular Orbital theory for homonuclear and heteronuclear (CO and NO) diatomic molecules, multicenter bonding in electron deficient molecules, bond strength and the bond energy, % ionic character from dipole moment and electronegativity difference. Weak interactions, hydrogen bonding, van der Waals forces.

B. 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 polarizability of ions. Fajan's rule, Metallic bond, free electron, Valence bond and Band theories.

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

Unit III

A. s-Block Elements : Comparative study, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, an introduction to alkyls and aryls.

B. p-Block Elements : Comparative study (including diagonal relationship) of groups 13-17 elements, compounds like hydrides, oxides, oxyacids and halides of groups 13-16.

Hydrides of boron-diborane and higher boranes. Borazine, borohydrides. Fullerenes, carbides, fluorocarbons, silicates (structural principle), tetrasulphur tetranitride, basic properties of halogens, interhalogens.

Unit IV

A. Arenes and Aromaticity : Nomenclature of benzene derivatives. The aryl group, 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 s and p 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. Birch reduction. Methods of formation and chemical reactions of alkylbenzenes and biphenyl.

B. Alkenes : Nomenclature of alkenes, methods of formation, mechanisms of dehydration of alcohols and dehydrohalogenation of alkyl halides, regio-selectivity 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 V

A. Cycloalkenes, Dienes and alkynes : Methods of formation, conformation and chemical reactions of cycloalkenes, 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, hydroborationoxidation and polymerization.

B. Alkyl and Aryl Halides : Nomenclature and classes of alkyl halides, methods of formation, chemical reactions; mechanisms of nucleophilic substitution reaction of alkyl halides, $\text{S}_{\text{N}}2$ and $\text{S}_{\text{N}}1$ 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 reactions mechanisms of nucleophilic aromatic substitution reactions. Relative reactivities of alkyl halides versus allyl, vinyl and aryl halides. Synthesis and uses of DDT, BHC and Freon.

Outcome:

- Upon successful completion of this course, students will understand theories of chemical bonding and determine the molecular geometry of molecules using VSEPR theory.
- Understand the general and physical properties of matter.
- Understand the basic model of the atom.

Chemistry Practical

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH2 04 | Chemistry-II (Physical and Organic chemistry) | 50 | 30 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

Max. Marks 50

Duration of practicals during the entire semester: 90 hours

Duration of practical during the semester examination: 4 hours

Inorganic chemistry

Inorganic mixture analysis 12 Marks

Macro/Semi-micro Analysis- Cation analysis, separation and identification of ions from group I-VI, anion analysis

Separation of cations by paper chromatography . 4 marks

Preparation of ferrous alum.

8 marks

Organic Chemistry:

(12 marks)

1. Detection of elements (N, S and halogens) 2 elements,

4 marks

2. Functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and aniline) in simple organic compounds.

2 functional groups:

8 marks

Viva:

6 marks

Records:

8 marks

Reference Books:

1. Unified Chemistry M. N. Tondan B.Sc. II SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. I Year
3. Yugbodh Unified Chemistry B.Sc. II SEM
4. Yugbodh Unified Practical Chemistry B.Sc. I Year
5. Stereochemistry : P. S. Kalsi
6. Practical Chemistry : Vogel

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBMA2 05 | Mathematics-II(Calculus differential Eqn. & Vector Calculus) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain concept of partial differential equation by Leinnitz theorem , Maclaurin,s theorem , Assymptotes & curvature

Explain Integration of irrational algebraic functions and transcendental functions , reduction formulae & definite integrals.

Explain Linear equations and equations reducible to the linear form

Explain Vector differentiation by gauss & Stokes theorem

Syllabus

Unit-1

Concept of Partial differentiation, Successive differentiation, Leibnitz theorem, Maclaurin and Taylor series expansions, Assymptotes and Curvature, Tests for concavity and convexity, Points of inflexion. Multiple points. Tracing of curves in cartesian and polar co-ordinates.

Unit-2

Integration of irrational algebraic functions and transcendental functions. Reduction formulae. Definite Integrals. Quadrature, Rectification, Volumes and Surfaces of solids of revolution of curves.

Unit-3

Linear equations and equations reducible to the linear form, Exact differential equation First order higher degree equations for x, y, p , Clairaut's form and singular solutions. Linear differential equations with constant coefficients.

Unit-4

Homogenous linear ordinary differential equations, linear differential equations of second order. Transformation of the equation by changing the dependent variable and the independent Variable, Method of variation of parameters, Ordinary simultaneous differential equations.

Unit-5

Vector differentiation. Gradient, Divergence and Curl. Vector integration, Theorem of Gauss (without proof) and problems based on it. Theorem of Green (without proof) and problems based on it. Stoke's theorem (without proof) and problems based on it.

Outcome

To be able to understand concept of partial differential equation by Leinnitz theorem , Maclaurin,s theorem , Assymptotes & curvature

To be able to understand ntegration of irrational algebraic functions and transcendental functions , reduction formulae & definite integrals.

To be able to understand Linear equations and equations reducible to the linear form

To be able to understand Vector differentiation by gauss & Stokes theorem

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credit s |
|---------------------|---------------------------------|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| HBHL3 02 | Hindi Language aur Samvedena | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the importance of charater & cultural

Explain the essay writing

Explain grammer

Explain the importance of Indian agriculture

Syllabus**इकाई .एक**

1. आचरण की सभ्यता : सरदार पूर्ण सिंह
2. जवानी (काव्य) : श्री माखनलाल चतुर्वेदी
3. विज्ञान : परिभाषा, शाखाएँ, संक्षिप्त इतिहास
4. सपनों की उड़ान : ए. पी.जे अब्दुल कलाम
5. प्रमुख वैज्ञानिक आविष्कार और हमारा जीवन

6. त्रुटि संशोधन

इकाई .दो

1. शिरीष के फूल-निबंध : आचार्य हजारी प्रसाद द्विवेदी
2. विकास का भारतीय मॉडलर: धर्मपाल
3. निबंध लेखन की कला
4. संधि.समास : संरचना और प्रकार
5. निराला : संस्मरण - महादेवी वर्मा

इकाई .तीन

1. मांडव (यात्रा वृत्तांत): पं. रामनारायण उपाध्याय
2. हिन्दी भाषा का मानकीकरण
3. भारतीय कृषि
4. जीवन : उद्भव और विकास
5. जनजातीय जीवन
6. उसने कहा था (कहानी) : श्री चन्द्रधर शर्मा गुलेरी

इकाई .चार

1. महाजनी सभ्यता (निबंध) : प्रेमचन्द
2. मुहावरे और लोकोक्तियाँ
3. सौर मण्डल
4. ब्रह्मण्ड और जीवन
5. शिकागो (व्याख्या) : स्वामी विवेकानंद
6. संक्षिप्तियां

इकाई .पांच

मध्यप्रदेश एवं छत्तीसगढ़ के पर्यटन स्थल

1. फिल्टर तो चाहिए ही. डॉ. देवेन्द्र दीपक
2. भारतीय वनस्पतियाँ और जीव
3. पर्यावरण
4. भोलाराम का जीवन (व्यंग्य) हरिशंकर परसाई
5. टाँगन का पंछी : विद्यानिवास मिश्र

Outcome

To be able to understand the importance of character & cultural

To be able to understand the essay writing

To be able to understand grammar

To be able to understand the importance of Indian agriculture

Reference :

Hindi Grantham Akadmi

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|-------------------------|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBES30 1 | Environmental Studies I | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the importance of Study of Environmental and ecology

Explain the importance of Environmental Pollution

Explain the importance Environment and social problems

Explain the importance of Environment conservation laws

Syllabus

UNIT – I Study of Environmental and ecology:

- (a) Definition and Importance.
- (b) Environmental Pollution and problems.
- (c) Public participation and Public awareness.

UNIT – II Environmental Pollution :

- (a) Air, water, noise, heat and nuclear pollution.

- (b) Causes, effect and prevention of pollution.
- (c) Disaster management – Flood, Earthquake, cyclones and landslides.

UNIT – III Environment and social problems :

- (a) Development – non-sustainable to Sustainable.
- (b) Energy problems of cities.
- (c) Water preservation – rain-water collection.

UNIT – IV Role of mankind in conserving natural resources :

- (a) Food resources – World food problem.
- (b) Energy resources – increasing demand for energy.
- (c) Land resources – Land as resources.

UNIT – V Environment conservation laws :

- (a) Conservation laws for air and water pollution.
- (b) Wildlife conservation laws.
- (c) Role of information technology in protecting environment & health.

Outcome

To be able to understand the importance of Study of Environmental and ecology

To be able to understand the importance of Environmental Pollution

To be able to understand the importance Environment and social problems

To be able to understand the importance of Environment conservation laws

Reference books

1. Fundamental of environmental studies—S.N. Tripathy ,Sunakar Panda-Vindra Publication
2. Environmental studies-R.Gupta- Ramesh Publication
3. Environmental studies-O.P.Gupta- Ramesh Publication
4. Unified Environmental science – Dr.S.B. Agarwal.

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

Department: - Science

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH3 03 | Physics-III(Kinetic Theory of Gases, Thermodynamics and Statistical Mechanics) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

To understand the kinectic theory of gases ,the pressure, the gas law. To understand the maxwe llian distribution of gases. To know about thermodynamics and statistical physics.

Syllabus

Unit-1

Kinetic Theory of Gases: Ideal Gas: Kinetic model, deduction of Boyle's law, interpretation of temperature, estimation of rms speeds of molecules. Brownian motion, estimate of the Avogadro number. Law of Equipartition of energy, specific heat of monatomic gas, extension to di- and tri- atomic gases, behavior at low temperatures. Adiabatic expansion of an ideal gas, applications to atmospheric physics.

Real Gas: Van der Waals gas, Equation of state, nature of Van der Waals forces, comparison with experimental P-V curves. The critical constants; gas and vapour. Joule expansion of ideal gas and Vander Waals gas, Joule coefficient, estimates of J-T cooling.

Liquefaction of gases: Boyle temperature and inversion temperature. Principle of regenerative cooling, liquefaction of hydrogen and helium. Refrigeration cycle, meaning of efficiency.

Unit-2

Thermodynamics: The laws of thermodynamics: The Zeroth law, various indicator diagrams, works done by and on the system, first law of thermodynamics, internal energy as a state function and other applications. Reversible and irreversible changes, Carnot cycle and its efficiency, Carnot theorem and the second law of thermodynamics, Different versions of the second law, practical cycles used in internal combustion engines. Entropy, principle of increase of entropy.

The thermodynamic scale of temperature; its identity with the perfect gas scale. Impossibility of attaining the absolute zero; third law of thermodynamics.

Thermodynamic relationships: Thermodynamic variables: extensive and intensive, Maxwell's general relationships, application to Joule – Thomson cooling and adiabatic cooling in a general system, Clausius-Clapeyron Latent heat equation.

Thermodynamic potentials and equilibrium of thermodynamical systems, relation with thermodynamical variables. Cooling due to adiabatic demagnetization, Production and measurement of very low temperatures.

Unit-3

Statistical Physics: The statistical basis of thermodynamics: Probability and thermodynamic probability, principle of equal a priori probabilities, probability distribution and its narrowing with increase in number of particles. The expressions for average properties. Constraints, accessible and inaccessible states, distribution of particles with a given total energy into a discrete set of energy states.

Some universal laws: The μ space representation, division of μ space into energy states and into phase cells of arbitrary size, applications to one-dimensional harmonic oscillator and free particles. Equilibrium between two systems in thermal contact, bridge with macroscopic physics. Probability and entropy, Boltzmann entropy relation. Statistical interpretation of second law of thermodynamics. Boltzmann canonical distribution law and its applications; Rigorous form of equipartition of energy.

Unit-4

Maxwellian distribution of speeds in an ideal gas: Distribution of speeds and velocities, experimental verification, distinction between mean, rms and most probable speed values. Doppler broadening of spectral lines. Black Body Radiation :Pure temperature dependence, Stefan-Boltzmann law, pressure of radiation, Spectral distribution of Black Body radiation. Wien's displacement law, Rayleigh-Jean's law, the ultraviolet catastrophe, Planck's quantum postulates, Planck's law, complete fit with experiment. Interpretation of behaviour of specific heats of gases at low temperature

Unit-5

Quantum Statistics: Transition to quantum statistics; "h" as a natural constant and its implications, cases of particle in a one dimensional box and one-dimensional harmonic oscillator. Indistinguishability of particles and its consequences, Bose-Einstein and Fermi-Dirac conditions; applications to liquid helium, Free electrons in a metal, and photons in blackbody chamber. Fermi level and Fermi energy. Transport Phenomena : Transport phenomena in gases;

Molecular collisions, mean free path and collision cross sections. Estimates of molecular diameter and mean free path. Transport of mass, momentum and energy and interrelationship, dependence on temperature and pressure.

PRACTICALS – PHYSICS-III

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH3 03 | Physics-III(Kinetic Theory of Gases, Thermodynamics and Statistical Mechanics) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

PRACTICALS

1. Study of conversion of mechanical energy into heat
2. Heating efficiency of electrical kettle with varying voltages.
3. Study of temperature dependence of spectral density of radiation
4. Resistance thermometry
5. Thermo-emf thermometry
6. Conduction of heat through poor conductors of different Geometries.
7. Experimental study of probability distribution for a two-option system using a coloured dice.
8. Study of statistical distributions on nuclear disintegration data.

Outcome:

This course will serve as the foundations for mechanical and auto mobile sector. It will also help other interdisciplinary course.

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH3 04 | Chemistry-III (Physical, Inorganic and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

- State the four great laws of thermodynamics and explain why they are considered great.
- Distinguish state functions from such non-quantities as heat and work.
- Calculate the idealized maximum efficiency of a heat engine or a refrigerator as deduced from a reversible Carnot cycle.

Syllabus

Physical Chemistry

UNIT I

Thermodynamics-1 Definition of thermodynamic terms: System, surrounding, Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.

First Law of Thermodynamics: Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's Law: Joule Thomson coefficient and inversion temperature.

Calculation of w , q , dU and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process. Thermochemistry: Standard state, standard enthalpy of formation: Hess's Law of heat summation and its application. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermochemical data, temperature dependence of enthalpy, Kirchoff's equation.

Second Law of Thermodynamics- Need for the law, different statements of the law, Carnot cycle and its efficiency. Carnot theorem. Thermodynamic scale of temperature.

UNIT II

Thermodynamics-II (a) Concept of entropy: Entropy as a state function, entropy as a function of P&T, entropy change in physical change, Clausius inequality, entropy as criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases. Third Law of Thermodynamics: Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data, Gibbs and Helmholtz functions, Gibbs function (G) and Helmholtz function (A) as a thermodynamic quantities, A and G as a criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change. Variation of G and A with P , V and T .

(b) Chemical equilibrium Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Le Chatelier's principle. Reaction isotherm and reaction isochore: Clapeyron equation and Clausius-Clapeyron equation, applications.

(c) Buffers: Mechanism of buffer action, Henderson-Hassel equation, Hydrolysis of salts.

(d) Corrosion: types, theories and methods of combating it.

Inorganic Chemistry

UNIT III

Chemistry of elements of I transition series: Characteristic properties of d-block elements. Properties of the elements of the first transition series, their binary compounds such as carbides, oxides and sulphides. Complexes illustrating relative stability of their oxidation states, coordination number and geometry chemistry of elements of II and III transition series: General characteristics, comparative treatment with their 3d-analogues in respect of ionic radii, oxidation states, magnetic behaviour, spectral properties and stereochemistry

UNIT-IV

(a) Coordination Compounds: Werner's coordination theory and its experimental verification, EAN Concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, VBT of transition metal complexes.

(b) Oxidation and Reduction: Use of redox potential data, analysis of redox cycle, redox stability in H_2O : Frost, Latimer and Pourbaix diagram. Principles involved in the extraction of elements.

Organic Chemistry

UNIT-V

(a) Electromagnetic Spectrum: Absorption Spectra; UV absorption spectroscopy: Absorption laws (Beer-Lambert law), molar absorptivity, presentation and analysis of UV spectra, types of electronic transitions, effect of conjugation.

Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated enes and enones. IR absorption spectroscopy; molecular vibrations, Hook's law, selection rules, intensity and position of IR bands, measurement of IR spectrum, fingerprint region, characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds.

(b) Alcohols: Classification and nomenclature. Monohydric alcohols: nomenclature, methods of formation by reduction of aldehydes, ketones, carboxylic acids and esters. Hydrogen bonding, acidic nature, reactions of alcohols. Dihydric alcohols: nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [Pb(OAc)₄ and HIO₄] and pinacole-pinacolone rearrangement. Trihydric alcohols-nomenclature and methods of formation, chemical reactions of glycerol

(c) Phenols: Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols: resonance stabilization of phenoxide ion. Reactions of phenols: electrophilic aromatic substitution, acylation and carboxylation. Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Hauben-Hoesch reaction, Lederer-Manasse reaction and Riemer-Tiemann reaction

(d) Ethers and Epoxides Nomenclature of ethers and methods of their formation, physical properties. Chemical reactions: cleavage and auto oxidation. Ziesel's method. Synthesis of epoxides. Acid and base-catalysed ring opening of epoxides, orientation of epoxide ring opening, reaction of Grignard and organolithium reagents with epoxides.

Outcome :

- Upon successful completion of this course, students will understand kinetics, equilibrium, LeChatelier's principle, acid and base reactions, pH, buffers, colligative properties, and electrochemical applications in an undergraduate laboratory.
- Understand the first law of thermodynamics and the role of energy and enthalpy in chemical reactions and perform thermochemical calculations.

Chemistry-III Practical

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allot ted Cred it s |
|------------------|--------------|-----------|-------------------|-----|-------|-----|-------------------|------------|----------------------------|---|---|---------------------------------|
| Subjec t Code | Subject Name | Tota l | Major | | Minor | | Max Mar | Min Mar | L | T | P | Subje ct |
| | | | Max | Min | Max | Min | | | | | | |

| | | Marks | Marks | Marks | Marks | Marks | ks | ks | | | | wise Distribution |
|---------------------|---|--------------|--------------|--------------|--------------|--------------|-----------|-----------|---|---|---|--------------------------|
| Theory group | | | | | | | | | | | | |
| SBCH3 04 | Chemistry-III (Physical, Inorganic and Organic chemistry) | 50 | 30 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

Time: 6 hours

Inorganic Chemistry 18 marks

Calibration of the fractional weights, pipettes and burettes. Preparation of standard solutions. Dilution of 0.1 M to 0.001 M solutions.

Quantitative analysis -Volumetric analysis.

- Determination of acetic acid in commercial vinegar using NaOH.
- Determination of alkali content- antacid tablet using HCl.
- Estimation of calcium content in chalk as calcium oxalate by permagnometry.
- Estimation of hardness of water by EDTA

Gravimetric analysis:

Barium as barium sulphate

Organic Chemistry Laboratory Techniques 18 marks

A. Thin layer chromatography

Determination of R_f values and identification of organic compounds.

- Separation of green leaf pigments (spinach leaves may be used).
- Preparation and separation of 2,4-dinitrophenylhydrazones of acetone, 2-butanone, hexane-2 and 3-one using toluene and light petroleum (40:6).
- Separation of a mixture of dyes using cyclohexane and ethylacetate (8:5:1.5). B. Paper chromatography: Ascending and Circular Determination of R_f values and identification of organic compounds
 - Separation of a mixture of phenylalanine and glycine, alanine and aspartic acid, leucine and glutamic acid. Spray reagent ninhydrin.
 - Separation of a mixture of DL-alanine, glycine and L-leucine using nbutanol: acetic acid: water (4:1:5). Spray reagent ninhydrin.
 - Separation of monosaccharides- a mixture of D-galactose and Dfructose using n-butanol: acetone: water (4:1:5). Spray reagent-aniline hydrogen phthalate.

Reference book.

1. Unified Chemistry M. N. Tondan B.Sc. III SEM
 2. Unified Practical Chemistry M. N. Tondan B.Sc. II Year
 3. Yugbodh Publication Unified Chemistry B.Sc. III SEM
 4. Unified Practical Chemistry B.Sc. II Year
 5. Organic Chemistry Mukhargee
 6. Practical Chemistry : Vogel
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(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBMA3 05 | Mathematics-III (Calculus differential Eqn. & Mechanics) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain mathematical application of sequence

Describe the application of continuity in one & two variable method

Describe the application of series solution

Describe the application of Laplace transform

Explain the application of mechanics

Syllabus

Unit -1

Definition of a sequence. Theorems on limits of sequences. Bounded and monotonic sequences. Cauchy's convergence criterion . Series of non-negative terms. Comparison test, Cauchy's integral test, Ratio test. Raabe's test ,logarithmic test. Leibnitz's theorem. Absolute and conditional convergence.

Unit -2

Continuity of functions of one variable , sequential continuity. Properties of continuous functions. Uniform continuity. Chain rule of differentiability. Mean value theorems and their geometrical interpretations. Darboux's intermediate value theorem for derivatives. Limit and continuity of functions of two variables.

Unit -3

Series Solution of Differential Equations-Power series Method, Bessel's Equation Bessel's function and its properties, recurrence and generating relations. Legendre's

Unit -4

Laplace transformations, Linearity of the Laplace transformation, Existence theorem of Laplace transforms, Laplace transforms of derivatives and integrals. Shifting theorem . Differentiation and integration of transforms. Inverse Laplace transforms, Convolution theorem. Applications of Laplace transformation in solving linear differential equations with constant coefficients.

Unit -5 Analytical conditions of equilibrium of Coplanar forces. Catenary. Forces in three dimensions. Velocities and accelerations along Radial and transverse direction

Outcome

To be able to understand mathematical application of sequence

To be able to understand the application of continuity in one & two variable method

To be able to understand the application of series solution

To be able to understand the application of Laplace transform

To be able to understand the application of mechanics

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DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| HBEL4 02 | English Language and Scientific Temper | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain Comprehension of an unseen passage

Explain Letter Writing

Explain Report Writing.

Explain Language Skills

Syllabus

UNIT – I

1. Tina Morris : Tree
2. Nissim Ezekiel : Night of the Scorpion
3. C.P. Snow : Ramanujan
4. Roger Rosenblatt : The Power of WE
5. George Orwell : What is Science?
6. C.Rajagopalachari : Three Questions
7. Desmond Morris : A short extract from the Naked Ape

8. A.G. Gardiner : On the rule of the road

UNIT – II

Comprehension of an unseen passage.

UNIT – III

Letter Writing : Formal Letters, Informal letters, Applications.

UNIT – IV

Report Writing.

UNIT – V

Language Skills

Correction of common errors in sentence structure : usage of pronouns, subject/ verb agreement word order, gender; compound nouns, collective nouns, possessives, articles and prepositions. (advanced)

Outcome

To be able to understand Comprehension of an unseen passage

To be able to understand Letter Writing

To be able to understand Report Writing.

To be able to understand Language Skills

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|---------------------|--------------------------|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBES 402 | Environmental Studies II | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

- Explain the importance of Problem of natural resources
- Explain the importance of Bio-diversity and its protection
- Explain the importance of Human Population and Environment
- Explain the importance of Multidisciplinary nature of environmental studies

Syllabus

UNIT – I

Problem of natural resources

- Problem of water resources – Utilization of surface and ground water, over utilization, flood, drought, conflicts over water, dams-benefits and problem.
- Problems of forest resources – uses and over utilization, deforestation, utilization of timber, dams and its effect on forests and tribes.
- Problems of land resources – Land as a source, erosion of land, man-induced landslides and desertification.

UNIT – II

Bio-diversity and its protection –

Value of bio-diversity – Consumable use : Productive use, Social, alternative, moral aesthetic and values.

India as a nation of bio-diversity and multi-diversity at global, national and local levels.

Threats to bio-diversity – Loss of habitat, poaching of wildlife, man-wildlife conflicts.

UNIT – III

Human Population and Environment

- (a) Population growth, disparities between countries.
- (b) Population explosion, family welfare Programme.
- (c) Environment and human health.

UNIT – IV

Multidisciplinary nature of environmental studies :

- (a) Natural resources
- (b) Social problems and the environment
- (c) Eco system.

UNIT – V

Environmental Wealth :

- (a) Rivers, ponds, fields and hills.
- (b) Rural, Industrial, Agricultural fields.
- (c) Study of common plants, insects and birds

Outcome

To be able to understand the importance of Problem of natural resources

To be able to understand the importance of Bio-diversity and its protection

To be able to understand the importance of Human Population and Environment

To be able to understand the importance of Multidisciplinary nature of environmental studies

Reference books

1. Fundamental of environmental studies—S.N. Tripathy ,Sunakar Panda-Vindra Publication
 2. Environmental studies-R.Gupta- Ramesh Publication
 3. Environmental studies-O.P.Gupta- Ramesh Publication
 4. Unified Environmental science – Dr.S.B. Agarwal
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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH4 03 | Physics-IV (Group Waves, Acoustics and Optics) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

To understand the waves, acoustics and wave optics of wave. To get a deep insight of the geometrical optics. To understand interferes , diffractions and polarizations phenomenon.

Syllabus

Unit-1

Waves: Waves in Media ; Speed of transverse waves on a uniform string, speed of longitudinal waves in a fluid, energy density and energy transmission in waves, typical measurements. Waves over liquid surface ; gravity waves and ripples. Group velocity and phase velocity, their measurements.

Superposition of waves : Linear homogeneous equations and the superposition principle, idea of nonlinear waves, non-validity of superposition principle and consequences. Standing waves ,Standing waves as normal modes of bounded systems, examples, harmonics and the quality of sound , examples. Chladni's figures and vibrations of a drum. Production and detection of ultrasonic and infrasonic waves and applications.

Unit-2

Acoustics: Noise and Music , The human ear and its responses , limits of human audibility, intensity and loudness, bel and decibel, the musical scales, temperament and musical instrument.

Reflection, refraction and diffraction of sound; Acoustic impedance of a medium, percentage reflection and refraction at a boundary, impedance matching for transducers, diffraction of sound, principle of a sonar system, sound ranging. Applied acoustics : Transducers and their characteristics. Recording and reproduction of sound, various systems, measurements of frequency, waveform, intensity and velocity. The acoustics of halls, reverberation period, Sabine's formula.

Unit-3

Geometrical Optics: Fermat's Principle of extremum path, the aplanatic points of a sphere and other applications. General theory of image formation: cardinal points of an optical system, general relationships for thick lens and lens combinations, Lagrange equation of magnification, telescopic combinations, telephoto lenses and eyepieces.

Aberration in images: Chromatic aberrations, achromatic combination of lenses in contact and separated lenses.

Monochromatic aberrations and their reductions; aspherical mirrors and Schmidt corrector plates, aplanatic points, oil immersion objectives, meniscus lens. Optical instruments: Entrance and exit pupils, need for a multiple lens eyepiece, common types of eyepieces.

Unit-4

Interference: Interference of light; The principle of superposition, two slit interference, coherence requirement for the sources, optical path retardations, lateral shift of fringes, Rayleigh refractometer and other applications. Localised fringes; thin films, interference by a film with two non-parallel reflecting surfaces, Newton's rings.

Haidinger fringes (Fringes of equal inclination). Michelson interferometer, its application for precision determination of wavelength, wavelength difference and the width of spectral lines. Intensity distribution in multiple beam interference, Fabry-Perot interferometer and etalon.

Unit-5

Fresnel Diffraction : Fresnel half period zones, plates, straight edge, rectilinear propagation.

Fraunhofer Diffraction: Diffraction at a slit, phasor diagram and integral calculus methods, the intensity distribution, diffraction at a circular aperture and a circular disc, resolution of images, Rayleigh criterion, resolving power of telescope and microscope. Outline of phase contrast microscopy.

Diffraction & Polarization : Diffraction gratings: Diffraction at N parallel slits, intensity distribution, plane diffraction grating, reflection grating and blazed gratings. Concave grating and different mountings. Resolving power of a grating and comparison with resolving powers of prism and of a Fabry-Perot etalon. Double refraction and optical rotation: Refraction in uniaxial crystals, its electro magnetic theory. Phase retardation plates, double image prism. Rotation of plane of polarization, origin of optical rotation in liquids and in crystals

PRACTICAL- PHYSICS-IV

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allot ed Credi ts |
|------------------|--------------|------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|----------------------------|
| Subjec t Code | Subject Name | Tota l Mar | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |

| | | ks | ks | ks | ks | ks | | | | | | Distribution |
|---------------------|--|----|----|----|----|----|---|---|---|---|---|--------------|
| Theory group | | | | | | | | | | | | |
| SBPH403 | Physics-IV (Group Waves, Acoustics and Optics) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

PRACTICALS

1. Study of interference using biprism.
2. Study of diffraction at straight edge.
3. Use of diffraction grating and its resolving limit.
4. Resolving power of telescope.
5. Polarization by reflection.
6. Study of optical rotation.
7. Refractive index and dispersive power of prism using spectrometer.
8. Speed of waves on a stretched string
9. Measurement of sound intensities with different situation
10. Characteristics of a microphone & loudspeaker system..

Outcome

It will establish foundations for optics, lasers and atomic physics. It is also important for sound and music devices.

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH4 04 | Chemistry-IV (Physical ,Inorganic and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

- Distinguish strong and weak acids and bases.
- Convert between the pH scale and concentrations of protons or proton acceptors in aqueous solution.
- Carry out titrations to determine the pH of an unknown aqueous solution to acceptable accuracy and precision.
- Prepare and use a pH buffer of required pH and ionic strength.

Syllabus

Physical Chemistry

UNIT -I

Phase equilibrium Statement and the meaning of the terms: phase component and the degree of freedom, derivation of the Gibbs phase rule. Phase equilibria of one component system: water, CO₂ and S system. Phase equilibria of two component system: solid liquid equilibria, simple eutectic: Bi-Cd, Pb-Ag system, desilverisation of lead.

Solid solutions: compound formation with congruent melting point (Mg-Zn) and incongruent melting point, (NaCl-H₂O) (FeCl₃-H₂O) and (CuSO₄-H₂O) system. Freezing mixtures, acetone-dry ice.

Liquid-liquid mixtures: Ideal liquid mixtures, Raoult's and Henry's law. Non-ideal system azeotropes: HCl-H₂O and ethanol water systems.

Partial miscible liquids: Phenol-water, trimethylamine-water and nicotine-water systems. Lower and upper consolute temperature. Effect of impurity on consolute temperature. Immiscible liquids, steam distillation, Nernst distribution law: thermodynamic derivation, applications.

UNIT-II

Electrochemistry Electrical transport- conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of specific conductance and equivalent conductance with dilution.

Migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number: Definition and determination by Hittorf method and moving boundary method. Application of conductivity measurements: determination of degree of dissociation, determination of K_a of acids, determination of solubility product of sparingly soluble salt, conductometric titrations.

Types of reversible electrodes: gas-metal ion, metal-metal ion, metal- insoluble salt-anion and redox electrodes. Electrode reactions, Nernst equation, derivation of cell E.M.F and single electrode potential, standard hydrogen electrode- reference electrodes-standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells, reversible and irreversible cells. Conventional representation of electrochemical cells.

EMF of a cell and its measurements. Computation of cell EMF. Calculation of thermodynamic quantities of cell reaction (G , H and K), polarization, over potential and hydrogen over voltage.

Concentration cell with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titration.

Definition of pH and pK, determination of pH using hydrogen, quinhydrone and glass electrodes by potentiometric methods.

UNIT III

(a) Chemistry of Lanthanides Elements: electronic structure, oxidation states, ionic radii and lanthanide contraction, complex formation, occurrence and isolation of lanthanide compounds.

(b) Chemistry of Actinides: General features and chemistry of actinides, chemistry of separation of Np, Pu and Am from U, Similarities between the later actinides and later lanthanides.

(c) Acids and Bases: Arrhenius, Brønsted-Lowry, Lux-Flood, Solvent system and Lewis concepts of acids and bases.

(d) Non-aqueous Solvents: Types of solvents and their general characteristics, reaction in non-aqueous solvents with reference to liquid NH₃ and liquid SO₂

Organic Chemistry

UNIT IV

(a) Aldehydes and ketones: Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes and ketones from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties. Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol perkin and knovenagel condensations. Condensation with ammonia and its derivatives. Wittig reaction, Mannich reaction.

Use of acetals as protecting group. Oxidation of aldehydes, Baeyer-Villiger oxidation of ketones, Cannizzaro reaction. Meerwein-Ponndorf-Verley (MPV), Clemmensen, Wolf-Kishner, LiAlH_4 and NaBH_4 reductions, Halogenation of enolizable ketones. An introduction of alpha, beta unsaturated aldehydes and ketones

(b) Carboxylic Acids: Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Preparation of carboxylic acids, reactions of carboxylic acids. Hell-Volhard-Zelinsky reaction.

Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation. Methods of formation and chemical reactions of unsaturated monocarboxylic acids. Dicarboxylic acids: Methods of formation and effect of heat and dehydrating agents. Methods of formation and chemical reactions of halo acids, hydroxyl acids, malic, tartaric and citric acids.

(d) Carboxylic acid derivatives Structure and nomenclature of acid chlorides, esters, amides (urea) and acid anhydrides. Relative stability of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions. Mechanism of esterification and hydrolysis (acidic and basic).

UNIT- V

Organic Compounds of Nitrogen Preparation of nitroalkanes and nitroarenes. Chemical reaction of nitroalkanes. Mechanism of nucleophilic substitution in nitroarenes and their reductions in acidic, neutral and alkaline media, Picric acid.

Halonitroarenes: reactivity, structure and nomenclature. Structure and nomenclature of amines, physical properties and stereochemistry of amines. Separation of mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Amine salt as phase transfer catalysts. Preparation of alkyl and aryl amines (reduction of nitro compounds, nitriles), reductive amination of aldehydic and ketonic compounds. Gabriel-Phthalamide reaction, Hoffmann bromamide reaction, Reactions of amines, electrophilic aromatic substitution in aryl amines, reaction of amines with nitrous acid. Synthetic transformation of aryl diazonium salts, azo coupling.

Outcome:

- Upon successful completion of this course, students will describe the bonding and properties of transition metal coordination compounds.

Chemistry Practical

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distribution | | | Allotted Credits |
|---------------------|--------------|-------------|-------------------|-----------|-----------|-----------|-------------------|-----------|---------------------|---|---|---------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distribution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |

| | | | | | | | | | | | | |
|-------------|--|----|----|---|----|---|---|---|---|---|---|---|
| SBCH4 04 | Chemistry-IV (Physical ,Inorganic and Organic chemistry) | 50 | 30 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |
|-------------|--|----|----|---|----|---|---|---|---|---|---|---|

Time: 6 hour

Organic Chemistry 12 marks

Qualitative analysis

Identification of an organic compound through the functional group analysis, determination of melting point and preparation of suitable derivatives.

Physical Chemistry 12 marks

Transition temperature

1. Determination of transition temperature of given substance by thermometric, dilatometric method (e.g.) ($MnCl_2 \times 4H_2O / SrBr_2 \times 2H_2O$).

Phase equilibrium

1. To study the effect of solute (e.g. NaCl, succinic acid) on the critical solution temperature of two partially miscible liquid (e.g., phenol water system) and to determine the concentration of that soluble in phenol water system.

2. To construct the phase diagram of two component (e.g., diphenyl amine benzophenone) by cooling curve method.

Thermochemistry 12 Marks

1. To determine the enthalpy of neutralization of weak acid/weak base versus strong acid/ strong base and determine the enthalpy of ionization of the weak acid/ base.

Inorganic chemistry-Quantitative Volumetric Analysis

1. Estimation of ferrous and ferric by dichromate method.

2. Estimation of copper using thiosulphate.

Viva 6 Marks

Sessional 8 Marks

References books

1. Unified Chemistry M. N. Tondan B.Sc. IV SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. II Year
3. Yugbodh Publication Unified Chemistry B.Sc. IV SEM
4. Yugbodh Publication Unified Practical Chemistry B.Sc. II Year
5. Atkins Peter & Julio De Paula : Physical Chemistry
6. Organic Chemistry Sharma & Sharma

7. Practical Chemistry : Vogel .

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(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBMA4 05 | Mathematics-IV (Advanced calculus Partial Differential Eqe. Complex Analysis and Abstract Algebra) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the method of partial differential equation and their applicatrion

Explain the method of maximaa & minima of two variable function & their application

Explain complex number & their application of differential function

Explain group automorphism theory

Syllabus

Unit -1

Partial differentiation. Change of variables. Euler's Theorem on homogeneous function, Taylor's theorem for functions of two variables. Jacobians, Envelopes, Evolutes.

Unit -2

Maxima, minima and saddle points of functions of two variables. Beta and Gamma functions. Double and triple integrals. Dirichlet's integrals.

Unit -3

Partial Differential equations of the first order. Lagrange's solution. Some special types of equations which can be solved easily by methods other than general methods. Charpit's general method of solution, Partial differential equations of second and higher orders. Homogeneous and non- Homogeneous equations with constant coefficients. Partial differential equations reducible to equations with constant coefficients.

Unit -4

Complex numbers as ordered pairs. Geometric representation of Complex numbers, Continuity and differentiability of Complex functions. Analytical function, Cauchy Riemann equation, Harmonic function, Mobius transformations, fixed point, cross ratio.

Unit -5

Group-Automorphisms, inner automorphism. Group of Automorphism, Conjugacy relation and centraliser. Normaliser. Counting principle and the class equation of a finite group. Cauchy's theorem for finite abelian groups and non abelian groups. Ring homomorphism. Ideals and Quotient Rings

Outcome

To be able to understand the method of partial differential equation and their application

To be able to understand the method of maxima & minima of two variable function & their application

To be able to understand complex number & their application of differential function

To be able to understand group automorphism theory

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: BIO- SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allot ed Credi ts |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| HBHL5 03 | Hindi Language (Bhasha Kaushal aur Sanchar Sadhan) | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain Indian cultural

Explain Indian Heritage

Explain means of communication

Explain basic computer concept

Syllabus

इकाई - 1

1. भारतीय संस्कृति
2. भारतीय समाज व्यवस्था
3. सभ्यता एव संस्कार
4. वैश्विक चेतना
5. समन्वयीकरण (भारतीय एव अंतर्राष्ट्रीय सदर्भ में)

इकाई - 2

1. धर्म
2. न्याय
3. दर्शन
4. नीति
5. साहित्य

इकाई - 3

1. संचार संसाधन : सम्पर्क के नए क्षितिज
2. समाचार पत्र
3. भारतीय प्रेस परिषद्
4. रेडियो
5. दूरदर्शन

इकाई - 4

1. सिनेमा
2. रंगमंच
3. सर्गीत
4. चित्र, मूर्ति, स्थापत्य कला
5. शिल्प कला

इकाई - 5

1. कम्प्यूटर
2. दूरभाष: विज्ञान की सौगात
3. मंत्र (कहानी): प्रमे चंद
4. मातृभूमि (कविता): मैथिलीशरण गुप्त
6. साहित्यकार का दायित्व: डॉ. प्रेम भारती

संदर्भ पुस्तक – मध्यप्रदेश हिन्दी ग्रंथ अकादमी भोपाल द्वारा प्रकाशित पुस्तक

Outcome

- To be able to understand Indian cultural
- To be able to understand Indian Heritage
- To be able to understand means of communication
- To be able to understand basic computer concept

Reference :

Hindi Grantham Akadmi

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| IBBC50 1 | Computer & Information Technology Basics-I | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain INTRODUCTION TO COMPUTER ORGANIZATION –I

Explain INTRODUCTION TO COMPUTER ORGANIZATION –II

Explain INPUT & OUTPUT DEVICES

Explain STORAGE DEVICES

Explain INTRODUCTION TO OPERATING SYSTEM

Syllabus

Unit -I

INTRODUCTION TO COMPUTER ORGANIZATION –I

History of development of Computer system concepts. Characteristics, Capability and limitations.

Generation of computer. Types of PC's Desktop. Laptop, Notebook. Workstation & their Characteristics.

Unit II :

INTRODUCTION TO COMPUTER ORGANIZATION –II

basic components of a computer system Control Unit, ALU. Input/Output function and Characteristics, memory RAM, ROM, EPROM, PROM.

Unit III :

INPUT & OUTPUT DEVICES

Input Devices : Keyboard, Mouse, Trackball. Joystick, Digitizing tablet, Scanners, Digital Camera, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, Touch Screen.

Output Devices: Monitors Characteristics and types of monitor, Video Standard VGA, SVGA, XGA, LCD Screen etc. Printer, Daisy wheel, Dot Matrix, Inkjet, Laser, Line Printer. Plotter, Sound Card and Speakers.

Unit IV :

STORAGE DEVICES : Storage fundamental primary Vs Secondary. Various Storage Devices magnetic Tape. Cartridge Tape, Data Drives, Hard Drives, Floppy Disks, CD, VCD, CD-R, CD-RW, Zip Drive, DVD, DVD-RW.

Unit V :

INTRODUCTION TO OPERATING SYSTEM : Introduction to operating systems, its functioning and types. basic commands of dos & Windows operating System.

Disk Operating System (DOS) - Introduction, History and Versions of DOS.

DOS Basics - Physical Structure of disk, Drive name, FAT, file & directory structure and naming rules, booting process, DOS system files.

DOS Commands - **Internal** - DIR, MD, CD, RD, Copy, DEL, REN, VOL, DATE, TIME, CLS, PATH, TYPE etc. **External** CHKDSK, SCOPE, PRINT DISKCOPY, DOSKEY, TREE, MOVE, LABEL, APPEND, FORMAT, SORT, FDISK, BACKUP, MODE, ATTRIB HELP, SYS etc.

Output

To be able to understand INTRODUCTION TO COMPUTER ORGANIZATION –I

To be able to understand INTRODUCTION TO COMPUTER ORGANIZATION –II

To be able to understand INPUT & OUTPUT DEVICES

To be able to understand STORAGE DEVICES

To be able to understand INTRODUCTION TO OPERATING SYSTEM

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Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distribution | | | Allotted Credits |
|---------------------|--|-------------|-------------------|-----------|-----------|-----------|-------------------|-----------|---------------------|---|---|---------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distribution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH503 | Physics-(Relativity, Quantum Mechanics, Atomic, Molecular and Nuclear) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objectives

To understand the crystalline structures, periodical lattice, thermal properties. To get knowledge about the semi conductor and semi conductor devices. To get knowledge about lasers and amplifiers.

Syllabus

Unit-1

Theory of Relativity:

Reference systems, inertial frames, Galilian Invariance and conservation laws, propagation of light, Michelson-Morley experiment; search for ether. Postulates for the special theory of relativity, Lorentz transformations, length contraction, time dilation, velocity addition theorem, variation of mass with velocity, mass - energy equivalence, particle with zero rest mass.

Origin of Quantum Theory: Failure of classical physics to explain the phenomena such as a black-body spectrum, photoelectric effect , Ritz combination principle in spectra. stability of an atom, Planck's radiation law, Einstein's explanation of photoelectric effect. Bohr's quantization of angular momentum and its application to hydrogen atom, limitations of Bohr's theory.

Unit-2

Quantum Mechanics: Wave-particle duality and uncertainty principle; de Broglie's hypothesis for matter waves; the concept of wave and group velocities, evidence for diffraction and interference of particles, experimental demonstrations of matter waves. Consequence of de Broglie's concepts; quantization in hydrogen atom; energies of a particle in a box, wave packets, Heisenberg's uncertainty relation for p and x , its extension to energy and time.

Consequence of the uncertainty relation; gamma ray microscope, diffraction at a slit, particle in a box, position of an electron in a Bohr's orbit, Schrödinger's equation. Postulates of quantum mechanics; operators, expectation values, transition probabilities, applications to a particle in one and three dimensional boxes, harmonic oscillator, reflection at a step potential, transmission across a potential barrier.

Unit-3

Atomic Physics: Solution of Schrodinger equation for Hydrogen atom; natural occurrence of quantum numbers- n , l and m , the related physical quantities. Spectra of hydrogen, deuteron and alkali atoms spectral terms, doublet fine structure. screening constants for alkali spectra for s, p, d and f states, selection rules, Singlet and triplet fine structure in alkaline earth spectra. L-S and J-J couplings.

Weak Spectra: Continuous X-ray spectrum and its dependence on voltage, Duane and Hundt's law.

Characteristic X-rays. Moseley's law; doublet structure of X-ray spectra. X-ray absorption spectra.

Unit-4

Molecular Spectra : Discrete set of electronic energies of molecules, quantization of vibrational and rotational energies, determination of internuclear distance, pure rotational and rotation-vibration spectra Dissociation limit for the ground and other electronic states, transition rules for pure vibration and electronic vibration spectra.

Spectroscopy : Raman Effect, Stokes and anti-stokes lines, complimentary character of Raman and infrared spectra, experimental arrangements for Raman Spectroscopy.

Spectroscopic techniques: Sources of excitation, prism and grating spectrographs for visible, UV and IR, absorption spectroscopy, double beam instruments, different recording systems.

Unit-5

Nuclear Physics: Interaction of charged particles and neutrons with matter, working of nuclear detectors, G-M counter, proportional counter, scintillation counter, cloud chamber, spark chamber and emulsions technique.

Structure of nuclei, basic properties (I , μ , Q and binding energy), deuterium binding energy, p - p and n - p scattering and general concepts of nuclear forces. Beta decay, range of alpha particle, Geiger-Nuttal law.

Gamow's explanation of alpha decay, beta decay, continuous and discrete spectra.

Nuclear reactions, channels, compound nucleus, direct reaction (concepts). Shell model, Liquid drop model,

Nuclear fission and fusion (concepts), energy production in stars by p - p and carbon - nitrogen cycles (concepts).

PRACTICAL- PHYSICS-V

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distribution | | | Allotted Credits |
|---------------------|--|-------------|-------------------|-----------|-----------|-----------|-------------------|-----------|---------------------|---|---|---------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distribution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH503 | Physics-(Relativity, Quantum Mechanics, Atomic, Molecular and Nuclear) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

PRACTICALS

1. Determination of Planck's constant.
2. Determination of e/m using Thomson's method.
3. Determination of e by Millikan's method.
4. Study of spectra of hydrogen and deuterium (Rydberg constant and ratio of masses electron to proton).
5. Absorption spectrum of iodine vapour.
6. Study of alkali or alkaline earth spectra using concave grating.
7. Study of Zeeman effect for determination of Lande g -factor.
8. Study of Raman spectrum using laser as an excitation source.
9. Determination of percentage of absorption of light by photometer

Outcome

This course will serve as the foundations for solid state industry and electronics industry. It is also important for semi conductor industry.

- **REFERENCES BOOKS**

- R.P. Singh Plant Physiology
- S.R. Singh and S. Shrivastava plant physiology and biochemistry
- B Verma plant physiology
- Pandey Biochemistry and physiology
- Rastogi Biochemistry m c graw hill pub.
- Hopkins, W.G.1995. Introduction toPlant Physiology.John Wiley & Sons, Inc, New York. USA.
- Moor,T.C.1989 Biochemistry And Physiology of Plant Hormones Springer- Verlag,New York, USA.
- Dr.S.B.Agarwal &Dr.Amit Agarwal Unified practical Botany.

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Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH5 04 | Chemistry-V (Physical, Inorganic and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

- Compare and contrast Arrhenius, Bronsted, and Lewis acids
- IR: Describe the molecular transitions responsible for the infrared absorption.
- UV-VIS: Explain the effect of conjugation on the absorption wavelength by sketching the molecular orbitals and relative energies.
- UV-VIS: Use UV-VIS data to calculate concentrations and assist in determining chemical structure.

Syllabus

Physical Chemistry

UNIT-I

Spectroscopy - I

(a) Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

(b) Rotational spectrum of diatomic molecules. Energy levels of a rigid rotator (semi classical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative description of non-rigid rotator, isotope effect.

(c) Raman spectrum, concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules, application of Raman spectrum.

Spectroscopy - II

(a) UV Spectroscopy : Electronic excitation, elementary idea of instrument used, Applications to structure determination of organic molecules. Woodward-Fieser rule for determining max of λ , ϵ of α,β -unsaturated carbonyl compounds.

(b) Infrared Spectrum : Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.

Inorganic Chemistry

UNIT II

Bioinorganic Chemistry - I Essential and trace elements in biological processes, metalloporphyrins with special reference to haemoglobin and myoglobin, Biological role of alkali and alkaline earth metal ions with special reference to Ca^{2+} . Nitrogen fixation.

Bioinorganic Chemistry - II Role of metal ions in biological process, Na/K pump, metal complexes as therapeutic agents anticancer agents, antiarthritits drugs and chelation therapy.\

UNIT- III

Hard and Soft Acids and Bases (HSAB) Classification of acids and bases as hard and soft, Pearson's HSAB concept, acid-base strength and hardness and softness, Symbiosis, theoretical basis of hardness and softness, electronegativity and hardness and softness.

Gravimetric Analysis Principles of gravimetric estimation, supersaturation, co-precipitation, post-precipitation and Ash treatment with respect to the estimation of Ba, Zn and Cu.

Water Analysis Hardness, types of hardness-Temporary, permanent and total hardness, acidity and alkalinity, BOD, COD and DO.

Organic Chemistry

UNIT -IV

Carbohydrates - I Classification and nomenclature, monosaccharide, mechanism of osazone formation, interconversion of glucose and fructose, chain lengthening and chain shortening of aldoses. Configuration of monosaccharide, erythro and threo diastereoisomers. Conversion of glucose into mannose. Formation of glycosides, ethers and esters, determination of ring size of monosaccharide, cyclic structure of D(+) glucose, mechanism of mutarotation. Structures of ribose and deoxyribose.

Carbohydrates - II An introduction to glycosidic linkages in di- and poly-saccharides. Reducing and non reducing sugars. Structure determination of maltose, sucrose, starch and cellulose.

UNIT -V

Elementary Idea of Fats, Oils and Detergents Natural fats, edible and industrial oils of vegetable origin, common fatty acids, glycerides, hydrogenation of unsaturated oils. Soapnification value, iodine value, acid value. Soaps and Detergents : Soaps, synthetic detergents, alkyl and aryl sulphonates

Synthetic Dyes: Colour and constitution (electronic concept). Classification of dyes. Chemistry and synthesis of methyl orange, Congo red, Malachite green, Crystal violet, Phenolphthalein, Fluorescein, Alizarin and Indigo. Nucleic acids Nucleic acid, introduction, constituents of nucleic acids. Ribonucleosides and ribonucleotides. The double helical structure of DNA.

Outcome:

- Understand Acid and Base reactions.
- How buffer systems work.
- How the body compensates for acid-base imbalances.

CHEMISTRY PRACTICAL – V

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH5 04 | Chemistry-V (Physical, Inorganic and Organic chemistry) | 50 | 30 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

Time: 6 hour

Inorganic Chemistry 12 Marks

Analysis of inorganic mixture containing five radicals with at least one interfering radical (phosphate, borate, oxalate or fluoride).

Organic Chemistry 12 Marks

Preparation:

(i) Acetylation

(ii) Benzoylation

(iii) meta-Dinitrobenzene

(iv) Picric acid

Physical Chemistry 12 Marks

(i) Effluent Analysis

Identification of cations and anions in different water samples.

(ii) Water analysis

To determine the amount of dissolved oxygen in water samples in ppm units.

Viva 06 Marks

Sessional 08 Marks

Reference books

1. Unified Chemistry M. N. Tondan B.Sc. V SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. III Year
3. Yugbodh Publication Unified Chemistry B.Sc. V SEM
4. Yugbodh Publication Unified Practical Chemistry B.Sc. III Year
5. P. S. Kalsi Spectroscopy of organic compounds
6. Bioinorganic Chemistry : Herman Dugas
7. Practical Chemistry : Vogel

(Board of studies)

(Academic Council)

(Registrar)

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBMA5 05 | Mathematics-V (Real analysis, linear algebra & Discrete Mathematics) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the application of Riemann integral

Explain the application of Fourirer series

Explain the method of application Basis of Dimenssions

Explain the method of application of Linear transformation

Explain the method of Binary Relation

Syllabus

Unit -1

Riemann integral, Integrability of continuous and monotonic functions, The fundamental theorem of integral calculus, Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables.

Unit -2

Schwarz and Young's theorem, Implicit function theorem, Fourier series of half and full intervals, Improper integrals and their convergence, Comparison test, Abel's and Dirichlet's tests, Frullani's integral, Integral as a function of a parameter.

Unit -3

Definition and examples of vector spaces, subspaces, Sum and direct sum of subspaces. Linear span, Linear dependence, independence and their basic properties. Basis, Finite dimensional vector spaces, Existence theorem for basis, Invariance of the number of elements of a basis set, Dimension, Dimension of sums of vector subspaces.

Unit -4

Linear transformations and their representation as matrices, The Algebra of linear transformations, The rank-nullity theorem, Eigen values and eigen vectors of a linear transformation, Diagonalisation. Quotient space and its dimension.

Unit -5

Binary Relations, Equivalence Relations, Partitions and Partial Order Relation . Graphs, Multigraphs, Weighted Graphs, Paths and Circuits, Shortest Paths. Trees and their properties.

Outcome

To be able to understand the application of Riemann integral

To be able to understand the application of Fourier series

To be able to understand the method of application Basis of Dimensions

To be able to understand the method of application of Linear transformation

To be able to understand the method of Binary Relation

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AISECT UNIVERSITY, Bhopal, (M.P.)
Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| HBEL6 03 | English Language and Aspects of Development | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the moral of story

Explain essay writing

Explain Translation of a short passage from Hindi to English.

Explain Drafting CV, writing e-mail message for official purpose

Explain Language Skills

Syllabus

Unit 1

1. William Wordsworth : “The World is Too Much With Us”
2. K. Aludiapillai : “Communication Education and Information Technology”
3. “Democratic Decentralisation”
4. S. C. Dubey : “Basic Quality of Life”
5. Sister Nivedita : “The Judgment Seat of Vikramaditya”
6. Juliun Huxley : “War as a Biological Phenomenon”
7. Robert Frost : “Stopping by Woods on a Snowy Evening”
8. Ruskin Bond : “The Cherry Tree”.

Unit II

Short Essay of about 250-300 words

Unit III

Translation of a short passage from Hindi to English.

Unit IV

Drafting CV, writing e-mail message for official purpose .

Unit V

Language Skills :

One-word substitution, homonyms, homophones, words that confuse, Punctuation, Idioms

Outcome

To be able to understand the moral of story

To be able to understand essay writing

To be able to understand Translation of a short passage from Hindi to English.

To be able to understand Drafting CV, writing e-mail message for official purpose

To be able to understand Language Skills

(Board of studies)

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Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allott ed Credi ts |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| IBBC6 02 | Computer & Information Technology Basics-II | 50 | 25 | 8 | 10 | 4 | 15 | 6 | 1 | 1 | - | 2 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 05 objective type questions of 05 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 04 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain Word Processing

Explain Introduction to Excel

Explain INTRODUCTION TO POWER POINT

Explain INTRODUCTION TO POWER POINT

SYLLABUS

Unit I –

Word Processing: Word

Introduction to word Processing.

- MS Word: features, Creating, Saving and Operating Multi document windows, Editing Text selecting, Inserting, deleting moving text.
- Previewing documents, Printing document to file page. Reduce the number of pages by one.
- Formatting Documents: paragraph formats, aligning Text and Paragraph, Borders and shading, Headers and Footers, Multiple Columns.

Unit II

Introduction to Excel

Excel & Worksheet :

- Worksheet basic.
- Creating worksheet, entering data into worksheet, heading information, data text, dates, alphanumeric, values, saving & quitting worksheet.
- Opening and moving around in an existing worksheet.
- Toolbars and Menus, keyboard shortcuts.
- Working with single and multiple workbook coping, renaming, moving, adding and deleting. coping entries and moving between workbooks.
- Working with formulas & cell referencing.
- Autosum.
- Coping formulas
- Absolute & Relative addressing.

Unit III

INTRODUCTION TO POWER POINT

- Features and various versions.
- Creating presentation using Slide master and template in various colour scheme.
- Working with slides make new slide move, copy, delete, duplicate, lay outing of slide, zoom in or out of a slide.
- Editing and formatting text: Alignment, editing, inserting, deleting, selecting, formatting of text, find and replace text.

Unit IV

POWER POINT – II

- Bullets , footer, paragraph formatting, spell checking.
- Printing presentation Print slides, notes, handouts and outlines.
- Inserting objects Drawing and Inserting objects using Clip Arts picture and charts.
- Slide sorter, slide transition effect and animation effects.
- Presenting the show making stand alone presentation, Pack and go wizards.

Unit V

Evolution, Protocol, concept, Internet, Dial-up connectivity, leased line, VSAT, Broad band, URLs, Domain names, Portals. E-mail, Pop & web based Email. Basic of sending and receiving Emails, Email & Internet Ethics, Computer virus, Antivirus software wage, Web Brower.

Outcome

To be able to understand Word Processing

To be able to understand Introduction to Excel

To be able to understand INTRODUCTION TO POWER POINT

To be able to understand INTRODUCTION TO POWER POINT

(Board of studies)

(Academic Council)

(Registrar)

Seal

AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributi on | | | Allot ed Credi ts |
|---------------------|---|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri butio n |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH6 03 | Physics-VI (Solid State Physics, Devices, Electronics and Lasers) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

To understand foundations of quantum mechanics, atomic and molecular. To get deep idea of nuclear physics and Special theory of relativity.

Syllabus

Unit-1

Overview: Crystalline and glassy forms, liquid crystals, glass transition. Crystal structure: Periodicity, lattices and bases, fundamental translation vectors, unit cell, Wigner-Seitz cell, allowed rotations, lattice types, lattice planes. Common crystal structures. Laue's theory of X-ray diffraction, Bragg's law, Laue patterns.

Bonding: Potential between a pair of atoms; Lennard-Jones potential, concept of cohesive energy, covalent, Vander Waal, ionic and metallic crystals Magnetism: Atomic magnetic moment, magnetic susceptibility, Dia, Para and Ferromagnetism, Ferro magnetic domains. Hysteresis.

Unit-2 Thermal properties: Lattice vibrations, simple harmonic oscillator, second order expansion of Lennard-Jones potential about the minimum, vibrations of one dimensional monoatomic chain under harmonic and nearest neighbour interaction approximation. Concept of phonons, density of modes (1-D). Debye model; Lattice specific heat low temperature limit, extension (conceptual) to 3-D. Band Structure: Electrons in periodic potential; nearly free electron model (qualitative), energy band, energy gap, metals, insulators, semiconductors.

Motion of electrons: Free electrons, conduction electrons, electron collisions, mean free path, conductivity and Ohm's law. Density of states. Fermi energy, Fermi velocity, Fermi-Dirac distribution.

Unit-3 Semiconductors: Semiconductors ; Intrinsic-semiconductors, electrons and holes, Fermi Level , Temperature dependence of electron and hole concentrations. Doping: impurity states, n and p type semiconductors, conductivity, mobility, Hall Effect, Hall Coefficient.

Semiconductor devices: Metal-semiconductor junction, p-n junction, majority and minority carriers, diode, Zener and tunnel diodes, light emitting diode, transistor, solarcell.

Power supply: Diode as a circuit element, load line concept, rectification, ripple factor, Zener diode, voltage stabilization, IC voltage regulation. Transistors : Characteristics of a transistor in CB, CE and CC mode, graphical analysis of the CE configuration, low frequency equivalent circuits, h-parameters, bias stability, thermal runaway.

FETs: Field effect transistors, JFET volt-ampere curves, biasing JFET, ac operation of JFET, source follower. MOSFET, biasing MOSFET, FET as variable voltage resistor.

Unit-4 Amplifiers- I: Small signal amplifiers ; General Principle of operation, classification, distortion, RC coupled amplifier, gain frequency response , input and output impedance, multistage amplifiers.

Amplifier- II: Transformer coupled amplifiers, Equivalent circuits at low, medium and high frequencies, emitter follower, low frequency common source and common drain amplifier, Noise in electronic circuits.

Oscillators: Feedback in amplifiers, principle, its effects on amplifiers, characteristics.

Principle of feedback amplifier, Barkhausen criteria, Hartley, Colpitt and Wein bridge oscillators.

Unit-5 Laser: Laser system: Purity of a spectral line, coherence length and coherence time, spatial coherence of a source, Einstein's A and B coefficients. Spontaneous and induced emissions, conditions for laser action, population inversion.

Types of Lasers (gas and solid state), Pulsed lasers and tunable lasers, spatial coherence and directionality, estimates of beam intensity, temporal coherence and spectral energy density.

PRACTICAL PHYSICS-VI

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distribution | | | Allotted Credits |
|---------------------|---|----------------|-------------------|--------------|--------------|--------------|-------------------|--------------|------------------------|---|---|---------------------------------|
| Subject Code | Subject Name | Total Marks | Major | | Minor | | Max Marks | Min Marks | L | T | P | Subject wise Distribution |
| | | | Max Marks | Min Marks | Max Marks | Min Marks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBPH6 03 | Physics-VI (Solid State Physics, Devices, Electronics) | 50 | 25 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

| | | | | | | | | | | | | | |
|--|-------------|--|--|--|--|--|--|--|--|--|--|--|--|
| | and Lasers) | | | | | | | | | | | | |
|--|-------------|--|--|--|--|--|--|--|--|--|--|--|--|

PRACTICALS

- 1. Characteristic of a transistor.
- 2. Characteristic of a tunnel diode.
- 3. Hysteresis curve a transformer core.
- 4. Hall probe method for measurement of resistivity.
- 5. Specific resistance and energy gap of a semiconductor.
- 6. Study of voltage regulation system.
- 7. Study of regulated power supply.
- 8. Study of Lissajos figures using a CRO.
- 9. Study of VTVM.
- 10. Study of RC coupled amplifiers
- 11. Analysis of a given band spectrum.
- 12. Study of crystal faces.
- 13. Study of laser as a monochromatic coherence source.

Outcome

This course will serve as the foundation course for higher and modern ideas . It will lay foundations for m.sc physics and P.Hd of physics.

• REFERENCES BOOKS -

- Odum E.P. 1971 Fundamentals of Ecology saundens, Philadelphia.
- Odum E.P. 1983 Basic Ecology Saundens Philadelphia.
- Smith R.L. 1996 Ecology and Field Biology Harper Collins New York.
- Heywood, V.H. and wation, R.T. 1995 Global biodiversity assement Cambridge university press

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: - SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH6 04 | Chemistry-VI (Physical, Inorganic and Organic chemistry) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective:

- Recognize the 20 amino acids and explain the differences in their chemical properties.
- Explain and sketch the periodic arrangements of secondary structures within a protein fold.
- Identify the packing of tertiary folds to form specific quaternary structures.

Syllabus

Physical Chemistry

UNIT I

(a) Photochemistry Interaction of radiation with matter, difference between thermal and photochemical process. Law of photochemistry-Grotthus-Draper law, Stark-Einstein law, Beer-Lambert's law. Determination of rate constant of unimolecular reactions. Electronic transitions, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of fluorescence, phosphorescence, non-radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions-energy transfer processes .

(b) Physical properties and molecular structures Optical activity, polarization-(Clausius-Mossotti equation), orientations of dipoles in an electrical field, dipole moment, induced dipole moment, measurement of dipole moment temperature and refractivity method. Dipole moment and structure of molecules, magnetic properties- paramagnetism, diamagnetism and ferromagnetism.

UNIT II

(a) Solutions, dilute solutions and colligative properties-I Ideal and non ideal solutions, methods of expressing concentrations of solutions, activity and activity coefficient. Dilute solutions- colligative properties. Raoult's law, relative lowering of vapour pressure, molecular weight determination. Osmosis, law of osmotic pressure and its measurements, determination of molecular weight from osmotic pressure.

(b) Solutions, dilute solutions and colligative properties-II Elevation of boiling point and depression of freezing point. Thermodynamic derivation of relation between molecular weight and elevation of boiling point and depression in freezing point. Experimental methods of determining various colligative properties. Abnormal molar mass, degree of dissociation and association of solute.

Inorganic Chemistry

UNIT III

Inorganic polymers Introduction and scope of inorganic polymers, special characteristics, classification, homo and hetero atomic polymers and their applications. Silicones and phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

UNIT IV

Organometallic chemistry

(a) Definition, nomenclature and classification of organometallic compounds. Preparation, properties, bonding and applications of alkyls and aryls of Li, Al, Hg, Sn and Ti.

(b) A brief account of metal-ethylenic complexes and homogeneous hydrogenation; mononuclear carbonyls and the nature of bonding in metal carbonyls. Transition metal organometallic compounds with bonds to hydrogen and boron.

(c) Metal nitrosyls: modes of coordination, nature of bonding and probable applications.

Organic Chemistry

UNIT V

(a) Organometallic compounds Organomagnesium compounds-the Grignard reagents-formation, structure and synthetic applications, organozinc compounds, formation and chemical reactions, Organolithium compounds-formation and chemical reactions.

(b) Organic synthesis via enolates Organic synthesis via enolates, acidity of α -hydrogens, alkylation of diethylmalonate and ethylacetoacetate. Synthesis of ethylacetoacetate, the Claisen condensation, keto-enol tautomerism of ethylacetoacetate. Alkylation of 1,3-dithianes, alkylation and acylation of enamines.

(c) Organosulphur compounds Nomenclature, structural features, method of formation and chemical reactions of thiols,

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allot ted Cred its |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|---|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBCH6 04 | Chemistry-VI (Physical, Inorganic and Organic chemistry) | 50 | 30 | 8 | 25 | 8 | - | - | - | - | 1 | 1 |

thioethers, sulphonic acids, sulphonamides and sulphaguanidine.

(d) Amino acids Classification, structure, stereochemistry of amino acids, acid base behaviour, isoelectric point, general methods of preparation and properties of α -amino acids

(e) Proteins and peptides Introduction to peptides linkage, synthesis and end group analysis of peptides, solid phase synthesis, classification, properties and structure of proteins (primary, secondary and tertiary).

CHEMISTRY PRACTICAL – VI

Inorganic Chemistry 12 Marks

Complex Compound Preparation:

1. Diaquabis(methyl acetoacetato)nickel(II)
2. Diaquabis(ethyl acetoacetato)cobalt(II)
3. Bis(methyl acetoacetato)copper(II) monohydrate
4. Potassium chlorochromate(IV)
5. Tetraamminecopper(II) sulphate monohydrate
6. Mercury(II) tetrathiocyanatocobaltate(II)
7. Hexaamminenickel(II) chloride

Organic Chemistry 12 Marks

Binary mixture analysis containing two solids: Separation, identification and preparation of derivatives.

Physical Instrumentation 12 Marks

(iii) Job's method

(iv) Mole-ratio method.

Viva 06 Marks

Sessional 08 Marks

Reference books

1. Unified Chemistry M. N. Tondan B.Sc. VI SEM
2. Unified Practical Chemistry M. N. Tondan B.Sc. III Year
3. Yugbodh Publication Unified Chemistry B.Sc. VI SEM
4. Yugbodh Publication Unified Practical Chemistry B.Sc. III Year
5. Advanced Inorganic Chemistry: F. A. Cotton
6. Peter Atkins Inorganic Chemistry
Practical Chemistry : Vogel

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AISECT UNIVERSITY, Bhopal, (M.P.)

Scheme of Examination

DEPARTMENT: BIO- SCIENCE

| Subject Details | | | Main Examinations | | | | Sessionals *** | | Credit Distributio n | | | Allott ed Credit s |
|---------------------|--|------------------------|-------------------|------------------|------------------|------------------|-------------------|------------------|----------------------------|---|---|--------------------------------------|
| Subjec t Code | Subject Name | Tota l Mar ks | Major | | Minor | | Max Mar ks | Min Mar ks | L | T | P | Subje ct wise Distri bution |
| | | | Max Mar ks | Min Mar ks | Max Mar ks | Min Mar ks | | | | | | |
| Theory group | | | | | | | | | | | | |
| SBMA6 05 | Mathematics-VI (Metric space, Numerical analysis and optional) | 100 | 50 | 17 | 20 | 7 | 30 | 12 | 3 | 2 | - | 5 |

Pattern:

The question paper will consist of six questions. Question no. 1 will have 10 objective type questions of 10 marks. Covering entire syllabus. Objective questions should have right mix of questions to test the logic, problem solving skill and reasoning. Each objective- questions should have four choices to pick up from. Remaining five questions will carry 08 marks each, one from each of the five units of the syllabus and may have internal choice. These five questions will have two parts A & B, preferably one theoretical and other/short notes. Questions Should test concepts, knowledge and application. Candidates are required to answer all the questions.

Objective

Explain the method of application of Metric space

Explain the3 method of application of continuous function

Explain the method of application of Linear equation

Explain the method of application of elementary statistics

Syllabus

Unit -1

Definition and examples of metric spaces. Neighbourhoods. Limit points. Interior points. Open and closed sets. Closure and interior. Boundary points. Subspace of a metric space. Cauchy sequences. Completeness, Cantor's intersection theorem, Contraction principle. Real numbers as a complete ordered field. Dense subsets. Baire Category theorem. Separable, first and second countable spaces.

Unit -2

Continuous functions. Extension theorem. Uniform continuity. Compactness, Sequential compactness. Totally bounded spaces, Finite intersection property. Continuous functions and compact sets. Connectedness

Unit -3

Solution of Equations: Bisection. Secant, Regula Falsi. Newton, Method. Roots of second degree Polynomials, Interpolation, Lagrange interpolation, Divided Differences, Interpolation formulae using Differences, Numerical Quadrature, Newton-Cote's Formulae, Gauss Quadrature Formulae.

Unit -4

Linear Equations: Direct Methods for Solving Systems of Linear Equations (Guass elimination, LU Decomposition. Cholesky Decomposition), Iterative methods (Jacobi. Gauss - Seidel Reduction Methods). Ordinary Differential Equations: Euler Method, Singlestep Methods, Runge-Kutta's Method, Multi-step Methods, Milne-Simpson Method. Methods Based on Numerical Integration, Methods Based on numerical Differentiation.

Unit -5

ELEMENTARY STATISTICS Measures of dispersion-range, inter quartile range, Mean deviation, Standard deviation, moments, skewness and kurtosis. Probability, Continuous probability, probability density function and its applications (for finding the mean, mode, median and standard deviation of various continuous probability distributions) Mathematical expectation, expectation of sum and product of random variables. Theoretical distribution- binomial, Poisson distributions and their properties and use, Moment generating functions.

OR**Unit -5**

PRINCIPLES OF COMPUTER SCIENCE Data Storage of bits Ram Memory. Mass storage. Coding Information of Storage. The Binary System Storing integers fractions, communication errors. Data Manipulation - The Central Processing Unit

The Stored Program concept. Programme Execution,. Arithmetic/Logic Instruction. Computer-Peripheral Communication. Operation System : The Evolution of Operating System.(Dos, Window) Operating System Architecture. Coordinating the Machine's Activities. Other Architectures.

OR**Unit -5**

MATHEMATICAL MODELING The process of Applied Mathematics. Setting up first order differential equations. Qualitative solution sketching. Stability of solutions. Difference and differential equation models of growth and decay. Single species population model, Exponential and logistic population models.

Outcome

To be able to understand the method of application of Metric space

To be able to understand the method of application of continuous function

To be able to understand the method of application of Linear equation

To be able to understand the method of application of elementary statistics

(Board of studies)

(Academic Council)

(Registrar)