

SYLLABUS (50%) FOR THE OBJECTIVE TEST OF **1ST SEMESTER**

SYLLABUS COMMON FOR ALL ENGG. BRANCHES (Mech., GE, Prod., Civil, Agri, Auto, Eltx, IC, Med. Eltx, EI, Comp, IT, CAD/CAM, CNC, Elect, Plastic, Mechatronics, Chem, Chem(P&P), Ceramic, Food Tech, Mech(Metallurgy), Mech(Foundry & Forging, Civil(Brick Technology), Civil(Const), Packaging, Printing)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

APPLIED PHYSICS-I

1. Unit and Dimensions. (8 hrs)

- 1.1 Physical quantities
- 1.2 Fundamental and derived units
- 1.3 Systems of unit (CGS, MKS and SI units)
- 1.4 Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity and strain)
- 1.5 Principle of homogeneity
- 1.6 Dimensional equations and their uses with examples.
- 1.7 Limitations of dimensional analysis.

2. Force and Motion (9 hrs + 6 hrs + 8 hrs)

- 2.1 Scalar and vector quantities - examples, addition and multiplication of vectors, scalar product and vector product of vectors
- 2.2 Force, resolution and composition of forces – resultant, parallelogram law of forces, friction, law of friction and type of friction.
- 2.3 Equilibrium of forces, Lami's theorem
- 2.4 Newton's Laws of motion – concept of momentum, determination of force equation from Newton's second law of motion, Newton's third law of motion Conservation of momentum, impulse and impulsive forces, simple numerical problems.
- 2.5 Projectile, horizontal and oblique projections and equation of Trajectory (Derivation) Derivation of time of flight, maximum height and horizontal range
- 2.6 Circular motion (Definition)
Relation between linear and angular velocity and linear acceleration and angular acceleration
- 2.7 Centripetal force (derivation) and centrifugal force Banking of roads.
- 2.8 Rotational Motion 6 hrs
Definition of torque, moment of inertia, radius of gyration, Derivation of rotational kinetic energy and angular momentum, Conservation of angular momentum (qualitative) related problems.
- 2.9 Planetary Motion 8 hrs
Newton's law of gravitation, Kepler's law of planetary motion, Escape velocity (derivation), Artificial satellites and related problems.

APPLIED CHEMISTRY-I

1. Language of Chemistry (6 hrs)

- 1.1 Definition of symbol, formula, valency and chemical equation.
- 1.2 Writing of the chemical formula of a simple chemical compound.
Calculation of percentage composition of a chemical compound
- 1.3 Essentials of a chemical equation, balancing of a chemical equation by Hit and Trial method

2. Atomic Structure (6 hrs)

Introduction to atom and its constituent particle, Dalton's, Rutherford's model. Bohr's model (postulates only), atomic number, mass number, isotopes, isobars, concept of atomic orbitals, shapes of S and P orbitals, quantum numbers, electronic configuration-Aufbau Principle, Hund's rule and Pauli's exclusion Principle, Hybridization (sp³, sp² and sp).

3. Chemical Bonding (4 hrs)

- 3.1 Electronic concept of binding.
- 3.2 Elementary account of electrovalent, covalent and coordinate bond formation on the basis of the electronic concept of valency with the help of suitable examples to each.
- 3.3 Orbital concept of covalent bond, Sigma and Pi bond.

APPLIED MATHEMATICS – I

1. Algebra (20 hrs)

- 1.1 Permutations and Combinations, Value of nPr and nCr , its properties and simple problems
- 1.2 Binomial theorem (without proof) for positive integral index (expansion and general term); Binomial theorem for any index (expansion only) first and second binomial approximation with application to engineering problems
- 1.3 Partial fractions (linear factors, repeated linear factors, non reducible quadratic factors)
- 1.4 Determinants and Matrices – expansion of determinants (upto third order) using sarrus rule, expansion method and pivotal's condensation method. Properties of determinants, solution of equations (upto 3 unknowns) by Cramer's rule.
Definition of matrix, addition, subtraction and multiplication of matrices (upto third order). Inverse of a matrix by adjoint method and elementary row transformations. Solution of equations (up to 3 unknowns) by Matrix method
- 1.5 Logarithm: general properties of logarithms, calculations of engineering problems using log tables

4. Complex Numbers (9 hrs)

Definition, Real and Imaginary parts of a complex number, Polar and Cartesian representation of a complex number and conversion from one form to the other, conjugate of a complex number, modulus and argument of a complex number, addition, subtraction, multiplication and division of a complex number.

DBM (Retail, Sales & Marketing, Tour & Travel, Banking & Insurance)

Communication Skills-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication

- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

Principles of management

- Management and its process of evolution
- Internal and external business environment
- Role of a manager
- Planning
- Organising
 - Types of organisation
 - Organisation structure and process
 - Managerial communication planning process
 - Controlling delegations and interdepartmental coordination

Economic & Social environment

- The Indian business and social environment
 - National economy
 - Globalisation and liberalisation of Indian economy and its impact on business and trade
 - Trends in major industrial sectors
 - Agriculture
 - Industrial
 - Banking and financial services
 - Infrastructure, power, transport, communication & information technology
 - tourism and travel
 -

Computer Applications in Management

- Microsoft Office Applications
 - Microsoft Word
 - Microsoft Excel
 - Microsoft PPT
- Computer systems and databases
- Information Technology
- Communication
- LAN
- WORLD WIDE WEB

Fundamentals of Customer Service

- **Focus on Customers:** Understanding the customers, understanding customer service, service triangle, benefits of exceptional customer service, customer delight, first impressions, perception vs. reality
- **Scanning environmental and cultural influences:** Environmental and cultural influences on customer behaviour

Organisational Behaviour

- **Focus and purpose:** Understanding organisational behaviour, definition and importance of organisational behaviour, nature, scope, framework, models of organisational behaviour, understanding people and organisation

- **Individual behaviour:** Personality and its influence on organisational behaviour. Characteristics of personality , causes of human behaviour, decision making process, organisational behaviour and its significance
- **Motivation and its elements:** Theories of motivation and their applications
- **Attitude and its measurement:** Attitude, methods to measure attitude, problems in attitude measurement

OFFICE MANAGEMENT AND COMPUTER APPLICATIONS

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

OFFICE METHODS AND PRACTICES– I

1. Introduction

- 1.1 Meaning of Office
- 1.2 Importance
- 1.3 Functions
- 1.4 Relation with other departments
- 1.5 Centralization and decentralization of office service
- 1.6 Allocation and distribution of work

2. Office Accommodation and Layout

- 2.1 Office location
- 2.2 Office accommodation
- 2.3 Office layout- objectives, principles and type

3. Office Environment

- 3.1 Significance of external surroundings and internal environment
- 3.2 Working facilities – lighting arrangements, seating arrangement, recreational facilities, safety and sanitary arrangement, pollution control

4. Handling Office Correspondence

- 4.1 Incoming correspondence procedures
- 4.2 Outgoing correspondence procedures

FUNDAMENTALS OF BUSSINESS MATHEMATICS AND STATISTICS

Introduction to statistical techniques, Collection and organization of statistical data, Presentation of statistical data, presentation of Statistical data, Measure of Central Tendency-Mean, Median, Mode

PRINCIPALS OF MANAGEMENT

1. Introduction: Nature and functions of management and its process of Evolution, Role and objectives of management in changing environment – manager as a facilitator rather than as a Dictator.
2. Nature and Process of planning : types of plans concept of corporate planning and strategic planning decision making.
3. Nature and process of organization : Types of organizational formats – Functional product , geographical matrix, team, delegation and decentralization concept of empowerment elements of organizational conflict and its management

FINANCE ACCOUNTS & AUDITING

Communication Skills-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

Fundamentals of Accounts

Accounting- Importance and scope, concepts & conventions, Generally Accepted Accounting Principles, Double Entry System, Accounting Equation, Subsidiary Books, Accounting Cycle, Journal, Ledger, Trial Balance, Rectification of errors,

Principles of Finance

Financial Management: Nature, Scope, Objectives. Time value of money, Risk & its types. Capitalisation, Investment decision, financial & operating leverage

Micro And Macro Economics

Definition of demand & supply, Elasticity of Demand, Marginal Utility theory, Indifference Curve Analysis and its applications, Revenue & Costs, Pricing under Perfect Competition, Monopoly, Monopolistic Competition, Pure and discriminating pricing.

Computer Fundamentals

Section I

Introduction to computers, MS Word- Create simple documents, opening files & saving text using different fonts, word art, bullets & numbering, inserting graphics and pictures spell check, using header and footer, creating tables using tabs, templates, linking and embedding, mail merge, formulae, sorting, printing its features.

ARCHITECTURE ASSISTANTSHIP

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

THEORY OF DESIGN

Definition, examples and applications of the following:

1. Primary Elements of Design (6 hrs)

- 1.1 Point
- 1.2 Line
- 1.3 Figure
- 1.4 Plane
- 1.5 Volume

2. Design Elements (8 hrs)

- 2.1 Line
- 2.2 Form
- 2.3 Space
- 2.4 Colour
- 2.5 Mass

3. Principles of Design (10 hrs)

- 3.1 Harmony
- 3.2 Balance
- 3.3 Rhythm
- 3.4 Texture
- 3.5 Contrast
- 3.6 Monotony
- 3.7 Unity
- 3.8 Scale
- 3.9 Proportion

BUILDING MATERIALS

1. Building Stones (4 hrs)

- 1.1 Utility of stones
- 1.1 Classification of rocks
- 1.2 Characteristics of good building stones
- 1.3 Testing of stones
- 1.4 Natural bed of stones
- 1.5 Common building stones
- 1.6 Prevailing market rates and sizes
- 1.7 Transportation costs
- 1.8 Standard measurements in the carriage transport
- 1.9 Storage systems/stacking system

2 Bricks (6 Hrs)

- 2.1 Classification of bricks – properties and uses of first class, second class, third class and over burnt bricks.
- 2.2 Characteristics of good brick
- 2.3 Size and weight of a standard brick and commonly available brick
- 2.4 Composition of brick earth
- 2.5 Test for burnt clay bricks – Compressive strength test, water absorption test and Efflorescence Test
- 2.6 Fire bricks, its properties, uses and availability
- 2.7 Availability of various types of bricks in the market e.g. machine made bricks, handmade firebricks.
- 2.8 Transportation cost with different modes of transportation and staking of bricks on the site
- 2.9 Brick Tiles

3 Lime (4 Hrs)

- 3.1 Uses of lime requirements with respect to its use as mortar since ancient times; structural strength and economics; classification of lime.
- 3.2 Setting action of fat lime and hydraulic lime
- 3.3 Storing of lime
- 3.4 Present day use of lime, its strength and curing segments with respect to its use as mortar since ancient times; structural strength and economics

4 Cement (4 Hrs)

- 4.1 Uses of cement
- 4.2 Composition of Portland cement
- 4.3 Setting and hardening of cement
- 4.4 Types of cement, their properties and uses
- 4.5 Storage of cement – transportation and carriage capacities

5. Aggregates (types, uses and transportation) (2 hrs)

- 5.1 Course Aggregates
- 5.2 Fine Aggregates

APPLIED SCIENCES AND MATHEMATICS

PART- I (APPLIED PHYSICS)

1. Units of measurement in SI system (2 hrs)

Dimensions and use of dimensional analysis

2. Force and motion (8hrs)

Newton's laws Conservation of momentum; work and energy forms of energy and conservation of energy; stress, strain, elastic moduli.

3. Spring mass system (6 hrs)

Vibration of bodies; amplitude, frequency and energy of vibrations; free and forced vibrations, resonance, vibration of structural members

4. Temperature and its measurement (4 hrs)

Liquid in glass thermometer, Bimetallic thermometer, Thermo-electric thermometer. Platinum resistance thermometer, pyrometers

PART- II (APPLIED CHEMISTRY)

1. Raw materials and admixtures used in the manufacture of copper, aluminum, iron and steel. Manufacturing processes to be dealt in brief with flow diagrams. (12 hrs)
2. Properties and uses of copper, aluminium iron and steel. Corrosion: Meaning of corrosion, Prevention of corrosion by various methods. (12 hrs)

PART- III (APPLIED MATHEMATICS)

1. ALGEBRA (6 hrs)

Logarithms, laws of logarithms (without proof), use of logarithms to solve problems of engineering nature.

Solution of three linear simultaneous equations by elimination. Binomial Theorem (without proof) for positive integral index (expansion and general term), binomial theorem (without proof) for any index (expansion only).

2. MENSURATION (16 hrs)

2.1 Mensuration of Plane figures:

Definition: Units of Measurement, Definition and formulae of perimeter and area etc. in connection with plane figures: rectangle, square, triangle, quadrilateral rhombus, trapezium (trapezoid), polygon, circle, irregular figures (trapezoidal Rule and Simpson's Rule) (simple problems)

2.2 Mensuration of Solids: Definition: Units: Volume: surface, including curved surface area and lateral surfaces areas of solids: Rectangular or parallelepiped, Cubes, Cuboids, Prisms, Cylinders and Hollow Cylinder, Pyramid, Frustum of right circular cone, sphere (simple problems)

APPLIED ART & CRAFT

Communication Skills-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

Histry Of Indian Art And Appreciation

1. Kala (2)

The origin of the word Kala. Definitions – Plato, Rabindra Nath Tagore, Tolstoy – Ruskin

2. Pre Historic Age (12)

Palaeolithic, Mesolithic, Neolithic. The quest of pre historic painting and important places of pre-historic art in India. Subject matter and style of prehistoric art. The importance and peculiarities of pre- historic art. The technique of pre-historic painting

3. Pre Buddha Period (16)

Jogimara Cave – paintings of Jogimara caves, importance of jogimara cave paintings
Buddha Period

Gandhara school – sculpture of gandhara school, specialities of gandhara sculpture, Ajanta, situation of Ajanta, discovery and renovation of Ajanta caves. The technique of Ajanta murals – subject matter of Ajanta caves – paintings of Ajanta cave No. 9, 10, 16, 17 and 19th caves.

LIBRARY AND INFORMATION SCIENCES

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

LIBRARY AND SOCIETY – I

1. **Concept of library in society:** its objectives, functions and role of library in the development of society. (6 hrs)
2. **Types of Libraries:** Public, Academic, Special, National - their role, functions and objectives (12 hrs)
4. Development of libraries in India after independence (4 hrs)

REFERENCE AND INFORMATION SERVICE - 1

1. Reference and Information Service: Concepts, definitions, importance and purpose. (6 hrs)
2. Laws of library science: implications for reference service (6 hrs)
3. Types of reference and information services (8 hrs)
 - Library Orientation
 - Ready reference service
 - Long range reference service
4. Reference and information sources – characteristics and evaluation (8 hrs)
5. Qualities and qualifications of reference librarian (4 hrs)

LIBRARY CLASSIFICATION – I

1. Library classification: Definition, need and functions (6 hrs)
2. Main features of DDC. (8 hrs)
3. Difference between knowledge classification and book classification. (6 hrs)

LIBRARY CATALOGUING – I

1. Library catalogue: definition, need and functions (6 hrs)
2. Physical forms of catalogue (6 hrs)
3. Types of library catalogue (6 hrs)

TEXTILE DESIGN(25)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication

- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

INTRODUCTION TO TEXTILE PROCESSES – I

1. Definition of fibre, yarn, fabric, classification of textile fibres and physical and chemical identification of textile fibres
2. Source and production of cotton, wool, jute silk fibres their end uses and properties
3. Cotton, wool, silk

STRUCTURAL FABRIC DESIGN – I

1. Introduction to fabric structure, explanation of woven structures and other fabric structures for example knitted, non-woven, bonded and embroidery, crochet and needle work
2. Definition of warp and weft, ends and picks, design, repeat of a design, crochet, needle work, draft, lifting or peg plan and denting order
3. Types of drafts and their uses in the manufacture of various fabrics
4. Construction of weaves on point or graph paper in relation of draft, design and peg plan (Mill visit)

ART APPRECIATION IN INDIAN TRADITIONAL TEXTILE DESIGN – I

1. Study of Indian embroidered textiles with reference to textiles with reference to
 - Historical significance
 - Construction techniques
 - Styles
 - Textures, colour and
 - Motifs
 - Centres of production
- a) Different Kashmir embroidery
- b) Panjabi Phulkari
- c) Himachal – Chamba Rumal
- d) Bihar and Bengal Suzni Kantha
- e) UP – Chikan Kari
- f) Orissa – Applique work
- g) Karnataka – Kasuti
- h) Gujrat and Rajasthan – Block Printing
- i) Saree of India – embroidered

FASHION TECHNOLOGY (29) & FASHION DESIGN(31)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
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- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

3.1 Punctuation

3.2 Articles-a, an, the

TEXTILE SCIENCE –I

1. Introduction to textile fibre, yarn and fabric
 - a) Classification of important textile fibres based on their origin and constituents
 - b) Important properties of fibres: cotton, jute, linen, wool silk, polyester, nylon, acrylic, spandex, viscose rayon
 - Relating to appearance (Color, Lustre, Shape, Surface, Contour, Length, Diameter)
 - Relating to Performance (Strengths/Tenacity)
 - Relating to Maintenance (Effect of biological organisms, chemicals, thermal conductivity and other environmental conditions)
2. New fibres and their properties – Tencel, lycra and technical textiles
3. a) Relevance of Thread count; linear density, balance yarn slippage to fabric performance
4. Yarn Processing
 - a) Manufacturing of cotton, linen, wool and silk
 - b) Sequence of spinning operation for making spun
 - c) Spinning – mechanical, chemical and melt

ELEMENTS OF DESIGN

1. Understanding design
2. Relationship to design in daily life
3. Elements of design
 - a) Lines; b) Dots; c) Shapes, How the line;dots and shapes are used in relation to the figure
4. Colour - theory, primary, secondary, subsecondary, hue, value, intensity, tints

BASIC PATTERN MAKING AND STYLE INTERPRETATION – I

1. Introduction to standard measurements, standards measurement charts, methods of taking measurements (direct, indirect, landmarks)
Classification of measurements – circumference, horizontal and vertical measurements
2. Methods of developing pattern
 - flat pattern
 - draping
3. Pattern making tools
pins and pin holders, scissors, measuring tapes, french curves, scales, curve scales, notcher, tracing wheel, pattern papers, markers etc.
4. Introduction to style interpretation

TEXTILE PROCESSING(26), TEXTILE TECHNOLOGY(27) & TEXTILE CHEMISTRY(51)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

1.1 Verbal and Non-verbal Communication

1.2 Process of Communication

- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

APPLIED MATHEMATICS – I

1. Algebra (20 hrs)

- 1.1 Permutations and Combinations, Value of ${}_{n}P_r$ and ${}_{n}C_r$, its properties and simple problems
- 1.2 Binomial theorem (without proof) for positive integral index (expansion and general term); Binomial theorem for any index (expansion only) first and second binomial approximation with application to engineering problems
- 1.3 Partial fractions (linear factors, repeated linear factors, non reducible quadratic factors)
- 1.4 Determinants and Matrices – expansion of determinants (upto third order) using sarrus rule, expansion method and pivotal's condensation method. Properties of determinants, solution of equations (upto 3 unknowns) by Cramer's rule.
Definition
of matrix, addition, subtraction and multiplication of matrices (upto third order).
Inverse of a matrix by adjoint method and elementary row transformations.
Solution of equations (up to 3 unknowns) by Matrix method
- 1.5 Logarithm: general properties of logarithms, calculations of engineering problems using log tables

4. Complex Numbers (9 hrs)

Definition, Real and Imaginary parts of a complex number, Polar and Cartesian representation of a complex number and conversion from one form to the other, conjugate of a complex number, modulus and argument of a complex number, addition, subtraction, multiplication and division of a complex number.

APPLIED SCIENCES

Part-1 (APPLIED PHYSICS)

1. Units and Dimensions

- 1.1 Physical quantities
- 1.2 Fundamental and derived units
- 1.3 Systems of units (FPS, CGS, MKS and SI units)
- 1.4 Dimensions and dimensional formulae of physical quantities (area, volume, velocity, acceleration, momentum, force, impulse, work, power, energy, surface tension, coefficient of viscosity and strain)
- 1.5 Principle of homogeneity
- 1.6 Dimensional equations and their applications, conversion from one unit to another unit for density, force, pressure, work, power, energy, velocity, acceleration

2. Force and Motion

- 2.1 Scalar and vector quantities – examples, addition and multiplication (scalar product and vector product) of vectors
- 2.2 Force, resolution and composition of forces – resultant, parallelogram law of forces
- 2.3 Equilibrium of forces, Lami's theorem
- 2.4 Newton's Laws of motion – concept of momentum, Newton's laws of motion and their applications, determination of force equation from Newton's second law of

- motion; Newton's third law of motion conversion of momentum, impulse and impulsive forces, simple numerical problems based on third law.
- 2.5 Projectile, horizontal and oblique projections and equation of trajectory
- 2.6 Derivation of time of flight, maximum height and horizontal range
- 2.7 Circular motion
- 2.8 Relation between linear and angular velocity and linear acceleration and angular acceleration
- 2.9 Centripetal force (derivation) and centrifugal force

3. Work, Power and Energy

- 3.1 Work: definitions and its SI units
- 3.2 Work done in moving an object on horizontal and inclined plane (incorporating frictional forces)
- 3.3 Power: definitions and its SI units, calculation of power in simple cases
- 3.4 Energy: Definitions and its SI units: Types: Kinetic energy and Potential energy, with examples and their derivation
- 3.5 Principle of conservation of mechanical energy (for freely falling bodies), transformation of energy from one form to another

4. Properties of Matter

- 4.1 Elasticity, definition of stress and strain
- 4.2 Different types of modulus of elasticity
- 4.3 Pressure – its units, gauge pressure, absolute pressure, atmospheric pressure, Bourdon's pressure, manometers and barometer gauges
- 4.4 Surface tension – its units, measurement of surface tension by capillary tube method, applications of surface tension, effect of temperature and impurity on surface tension
- 4.5 Viscosity and coefficient of viscosity

Part- B APPLIED CHEMISTRY

1. Language of Chemistry

- 1.1 Definition of symbol, formula, valency and chemical equation.
- 1.2 Writing of the chemical formula of a simple chemical compound.
Calculation of percentage composition of a chemical compound
- 1.3 Essentials of a chemical equation, balancing of a chemical equation by Hit and Trial method

2. Water

- 2.1 Hard and soft water, types of hardness and its causes, disadvantages of hardness of water (i) in industrial use (ii) in boilers for steam generation.
- 2.2 Methods to remove hardness of water (i) Clark's Process (ii) Permutit Process (iii) Soda Lime process (iv) Ion-Exchange process. Simple numerical problems related to soda lime process.
- 2.3 Definition of degree of hardness of water and the systems to express the degree of hardness of water.
- 2.4 Qualities of water used for drinking purposes, treatment of river water to make it fit for town supply

3. Solutions

- 3.1 Concept of homogenous solution, brief introduction of the terms (i) Ionization (ii) Acidity (iii) Basicity (iv) equivalent weight and gram equivalent weight with suitable examples
- 3.2 Strength of a solution (i) Normality (ii) Molarity (iii) Molality as applied in relation to a solution.
- 3.3 Definition of pH, and different industrial applications of pH

ENGINEERING DRAWING – I

1. Drawing Office Practice

- 1.1 Drawing instruments
- 1.2 Sizes and layout of standard drawing sheets
- 1.3 Sizes of drawing boards
- 1.4 Drafting table/board

2. Different types of Lines and Free Hand Sketching (1 sheet)

- 2.1 Different types of lines in engineering drawing as per BIS specifications
- 2.2 Practice in free hand sketching of vertical, horizontal and inclined lines, geometrical figures such as triangles, rectangles, small and large circles, parabolas, curves and ellipses

3. Lettering Techniques and Practice (2 sheets)

- 3.1 Instrumental single stroke (capital and inclined) lettering of 35 mm height in the ratios of 7:4
- 3.2 Instrumental double stroke lettering of 35 mm height in the ratio of 7:4, vertical
- 3.3 Free hand lettering (alphabet and numerals) lower case and upper case, single stroke vertical and inclined at 75 degree in different standard series of 2.5, 3, 5, 7, 10, and 15 mm heights in the ratio of 7:4

4. Dimensioning (1 sheet)

- 4.1 Necessity of dimensioning, terms and notations – methods and principles, dimensioning small components as in 4.2 below (mainly theoretical instructions)
- 4.2 Dimensioning of overall sizes, circles, thread holes, chamfered surfaces, angles, tapered surface holes equally spaced on PCD, counter sunk hole counter bored holes, cylindrical parts, narrow space and gaps, radii, curves and arches – chain and parallel dimensioning

5. Scale (3 sheets)

- 5.1 Scales – their need and importance, Definition of representative fraction (RF); Find RF of a given scale
- 5.2 Types of scales
- 5.3 Construction of plain and diagonal scales

TEXTILE RAW MATERIALS

1. Introduction to language/terminology of textiles
2. Definition of textile fibre, Classification of textile fibres
3. Important varieties of cotton for coarse, medium and fine yarns (available in India). Important varieties of wool and silk. Grading of cotton, wool and silk
4. Physical and Chemical identification of textile fibres
5. Manufacturing of different fibres i.e. viscose rayon, nylon

INDUSTRIAL PERSONEL MANAGEMENT I.P.M.(13)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

3.1 Punctuation

3.2 Articles-a, an, the

INDUSTRIAL ORGANIZATION

1. Concept of business, trade, commerce and industry, importance of commerce in industry, organization of business. The essential requisites for business success; Social responsibility of business
2. Types of ownership of Industrial Organization
 - a) Sole proprietorship
 - b) Hindu undivided family
 - c) Partnership
 - d) Co-operative Societies
 - e) Joint stock companies
 - f) Form of public sector undertakings

ESSENTIALS OF MANAGEMENT

1. Introduction
 - 1.1 Concept, scope and importance of management
 - 1.2 Role, objectives and functions of management
 - 1.3 Principles of management
2. Planning
 - 2.1 Concept and importance
 - 2.2 Planning process
 - 2.3 Meaning and importance, purpose, mission, objectives, short term, long term and strategic planning, policies and procedures
 - 2.4 Meaning, importance and process of decision making
3. Organizing
 - 3.1 Concept and importance
 - 3.2 Concepts, advantages and disadvantages of formal, informal, functional, line, staff and committee types of organization
 - 3.3 Concepts, importance and difference between delegation and decentralization

BUSINESS ECONOMICS

1. Basic Concepts
Utility, goods, value, price, wealth, human wants and classification of wants in to necessities, comforts and luxuries
2. Consumption
Concept of utility and marginal utility, laws of diminishing marginal utility and equi-marginal utility, indifference curves, demand and laws of demand elasticity of demand and its measurement, point elasticity and arc elasticity
3. Production
Characteristics of factors of production, land, labour, capital, organization and enterprise. Efficiency and division of labour, capital formation and function of entrepreneur, laws of returns to scale, law of diminishing returns (variable proportions)
4. Market
Meaning, size and types.

ORGANIZATIONAL BEHAVIOUR – I

1. Individual Behaviour
Meaning and concept of individual behaviour, basis of individual differences, abilities, learning aptitudes, attitudes value measurement
2. Personality

- Nature and determinants of personality, self concept and defensive behaviour, perception, perceptual selection and distortion
3. Self Development
Understanding of self, transactional analysis

MEDICAL LAB TECHNOLOGY M.L.T.(19)

COMMUNICATION SKILLS-I

1. COMMUNICATION SKILLS (6 hrs)

- 1.1 Verbal and Non-verbal Communication
- 1.2 Process of Communication
- 1.3 Barriers to Communication; Overcoming Strategies
- 1.4 Listening and Speaking Skills and Sub-Skills

3. GRAMMAR AND USAGE (12 hrs)

- 3.1 Punctuation
- 3.2 Articles-a, an, the

CHEMISTRY

1. Introduction to Chemistry

Role of chemistry in biological system and its relevance to medical laboratory technology; health and safety in chemistry laboratory; Use and care of plastic/glass ware; SI units and their use

2. Basic idea of atom and molecule; atomic number, mass number, molecular mass and equivalent mass

3. Colloids

Types of colloids, formation, properties and their importance in biological system

4. Acids and Bases

Definition, action on tissue, neutralization, salts, and solubility of salts
Hydrogen ion concentration and pH, measurement of pH and its importance, pH meter

Indicators and buffer solutions, mode of action, buffering capacity and range of buffering action, important physiological buffers

5. Solutions

Solute and solvent, normal, molar, molal and strength, percentage solutions, saturated solutions, solubility, effect of various factors on solubility, principle and use of analytical balance, use of volumetric apparatus (pipettes, volumetric flask, burette, measuring cylinder)

6. Electrolytes and ionization, introduction and properties of electrolytes and theory of ionization, role of electrolytes

7. Oxidation and reduction definitions, oxidation and reduction reactions and uses of oxidizing and reducing agents. Volumetric analysis of primary and secondary standards

8. Water: Dissociation of water, properties of water preparation of distilled water and deionized water, hydrates and dehydration, importance of water

9. Introduction to organic chemistry

- a) The importance of organic compounds
- b) Comparison of organic and inorganic compounds
- c) Properties of carbon
- d) IUPAC Nomenclature of organic compounds

10. Hydrocarbons

Sources, preparation, properties and uses of following:

- a) Saturated hydrocarbons

b) Unsaturated hydrocarbons

ANATOMY AND PHYSIOLOGY – I

1. Introduction to human body, its anatomy and physiology
2. Elementary tissues of body and their classification along with brief description
3. Digestive system
 - 3.1 Organs of digestion, histology of the digestive organs (stomach, small intestine) and accessory organs (liver, pancreas)
 - 3.2 Process of digestion of food
 - 3.3 Absorption and assimilation of food
 - 3.4 Vitamins and minerals
4. Respiratory system
 - 4.1 Organs of respiration and their histology (lungs and trachea)

CLINICAL MICROBIOLOGY – I

1. Introduction to Microbiology
Definition, history, relationship of micro-organisms to man, and safety guideline in a microbiology laboratory
2. Morphology of bacteria
Anatomy of a bacterial cell including spores, flagella and capsules
3. Bacterial Growth and Nutrition of bacteria
Bacterial growth curve and bacterial nutrition
4. Classification of micro-organisms with special reference to bacteria
 - General
 - Biological
5. Sterilization
Definition, sterilization by dry heat, moist heat (below, at and above 100°C), autoclave and hot air oven its structure and functioning, preventive measures, controls and sterilization indicators, sterilization by radiation and filtration (seitz)
6. Antiseptics and Disinfectants
Definitions, types, properties, use of disinfectants and antiseptics, efficiency testing of disinfectants; use of laminar flow – principle and function
7. Microscopy
Care, principle, working and preventive maintenance of simple and compound Microscope

CLINICAL HAEMATOLOGY - I

1. Introduction to haematology
2. Apparatus and Instruments
Parts, functions, principles/maintenance and working of microscope, centrifuge, water bath, differential cell counter, shaker, pH meter
 - 2.1 Washing, cleaning and sterilization of glass and plastic ware
 - 2.2 General and volumetric apparatus cleaning
3. Haemopoiesis
 - 3.1 Erythropoiesis, leucopoiesis, thrombopoiesis
 - 3.2 Definition, composition and functions of blood
 - 3.3 Normal values

CLINICAL BIOCHEMISTRY – I

1. Introduction to Biochemistry
 - 1.1 Definition
 - 1.2 Importance of biochemistry
 - 1.3 SI Units and their use
 - 1.4 Volumetric apparatus and their calibration
2. Cleaning and storage of laboratory, glass and plastic ware

- 2.1 Cleaning and care of laboratory glass and plastic ware
- 2.2 Different cleaning agents (soaps, detergents, chromic acid)
- 2.3 Methods of cleaning and storage
- 3. Important instruments; principle of working, handling and care of
 - 3.1 Balance (Analytical, electrical/electronic)
 - 3.2 Centrifuge
 - 3.3 Colorimeter