अखिल भारतीय आयुर्विज्ञान संस्थान, भुवनेश्वर
All India Institute of Medical Sciences, Bhubaneswar
सिजुआ, डाक:डुमुडुमा,भुवनेश्वर -751019
Sijua, Post: Dumuduma, Bhubaneswar - 751 019

No. AIIMS/BBSR/RECT/2023/990/B&C/2100 **Dated- 25.07.2023**

SCHEME OF EXAMINATION AND INDICATIVE SYLLABUS FOR VARIOUS NON-FACULTY POSTS OF PHASE-I

In reference to Vacancy Notice No. AIIMS/BBSR/RECT/2023/990/B&C/1583 Dated 01.07.2023 & Notice No. AIIMS/BBSR/RECT/2023/990/B&C/2016 Dated 20.07.2023 uploaded on the official website of AIIMS Bhubaneswar for filling up of various Group 'B' and 'C Non-faculty posts at AIIMS Bhubaneswar, the indicative syllabus and scheme of examination for the Phase-I posts is annexed.

2. The Important terms and conditions are as follows

2.1 The candidates are advised to download their Admit Cards from the website of AIIMS Bhubaneswar i.e. https://aiimsbhubaneswar.nic.in/ . Only website generated Admit Card will be treated authentic and permissible to appear in the said Examination. No admit card will be sent by Speed Post..

2.2 As per practice, the Online Computer Based Test (CBT) for the advertised posts will be conducted without pre-examination screening of the applications of the candidates with regard to their eligiblity. Hence, the candidate will be allowed **PROVISIONALLY** to appear in the online (CBT) Recruitment Examination.

2.3 However, the original documents of all selected candidates related to fulfilment of eligibility criteria, experience etc. will be verified by the Institute before final appointment.

2.4 The city for examination will be allocated on the basis of order of application form, candidates choices and availability of computer nodes. Decision of AIIMS Bhubaneswar in this regard will be final and no further correspondence will be entertained in this regard.

2.5 All applicants are required to visit the institute's website regularly as all subsequent Corrigendum/Addendum/ Updates will only be uploaded on the official website of AIIMS Bhubaneswar i.e. https://aiimsbhubaneswar.nic.in/ .

2.6 **Resolution of Tie Cases**: In cases where more than one candidate secures equal MARKS, tie will be resolved:

a. Accuracy in Skill Test (if applicable), otherwise
b. Date of birth shall be used [candidates who are older / born earlier will be placed above candidates who are younger / born later].

2.7 **Medium of Examination:** Hindi/English

2.8 01 mark will be awarded for each correct answer and there will be negative marking of 0.25 marks for each wrong answer.

-sd-
(Ravi Prakash, IOFS)
Deputy Director (Admin)
AIIMS Bhubaneswar

SYLLABUS FOR THE POST OF DIETICIAN

Subject Knowledge (100 Marks)

A. Human Physiology (10 Marks):

General principles of Physiology

The Skeleton – General Account

- The Muscular System – General Account -Types of muscles, characteristics of each, Similarities and Differences.
- Blood and Circulatory System – Blood and its composition, Functions of each constituent of blood, Blood groups, Blood transfusion and its importance, Coagulation of blood, Blood vessels, Structure and functions of heart, Blood pressure, heart rate, Cardiac output and their regulation.
- Lymphatic System – Lymph, Lymph glands and functions, Spleen – Structure and Functions.
- Respiratory System – Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration.
- Digestive System – Structure and Functions of Alimentary tract. Functions of various secretions and juices – Saliva, Gastric, Bile, Intestinal, Pancreatic. Functions of enzymes in digestion. Digestion of nutrients – Proteins, Fats, Carbohydrates. Common problems of Digestive tract – Vomiting, Constipation, Diarrhoea.
- Excretory System – Structure and Functions of (a) Kidney (b) Ureter (c) Bladder (d) Skin. Urine -Formation of urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature.
- Nervous System – Structure of Nerve Cell, Fibre, Classification of Nervous System, Central Nervous System – Brain, Lobes of brain, Cerebrum, Cerebellum, Medulla oblongata, Hypothalamus. Pituitary Gland – structure, Functions, Spinal Cord – structure and functions, Autonomic and Sympathetic nervous system.
- Reproductive System – Female reproductive system – organs, structure and functions Male reproductive system– structure and functions, Menstruation, menstrual cycle, Puberty, Menarche, Menopause, Fertilization of ovum, Conception, Implantation
- Sense Organs – Eye – structure and function, Ear – structure and function, Skin -structure and function
- Glands and Endocrine System – o Liver – structure and function o Gall Bladder – structure and function o Enterohepatic circulation o Pancreas – structure and function o Endocrine system o Endocrine glands – structure and function. Hormone – types and functions, role in metabolism.
- Endocrine disorders o Regulation of Hormone Secretion

B. Biochemistry (10 Marks):

- Introduction to Biochemistry – Significance of pH, Acid-Base Balance, Cell Structure, Composition, Organelles, Membrane and Function Alterations and Significance.
- Carbohydrates – Structure and properties of Mono-saccharides, Disaccharides, Poly-saccharides. Study of intermediary metabolism of carbohydrates, Glycolysis, Aerobic, Anaerobic, Tricarboxylic acid cycle, Significance of TCA cycle integrating metabolism of carbohydrates protein and lipid, Gluconeogenesis, Glycogenesis, Glycogenolysis, Hexose monophosphate shunt.

- Proteins – Structure, composition Classification and Function, Structure of important proteins with special reference to Insulin, myoglobin, and hemoglobin, Binding proteins and their functions – nutritional implications, Chemistry of amino acids, Metabolism of Proteins and amino acids – Build up of amino acid pool. Urea Cycle, Creatinine and Creatine Synthesis, Biochemical parameters and alterations in disease states and Protein malnutrition, Pregnancy, Inborn errors of metabolism.
- Lipids – Definition, Composition, Classification, Structure and Properties, Lipoproteins, Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of ketone bodies, Biosynthesis of fatty acids, Phosphoglycerides, Biosynthesis of cholesterol and regulation, Bile acids and their metabolism, Plasma lipoproteins – Synthesis and Metabolism, Biochemical profile, alterations and significance, Prostaglandins.
- Enzymes – Definition, Classification specificity of enzymes -Intracellular distribution, kinetics, inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis.
- Nucleic Acids – Composition, Functions, Classification, Structure and properties of DNA and RNA, Replication and transcription of genetic information, Mechanics of DNA replication, transcription, translation, Genetic code – Protein biosynthesis, Regulation of biosynthesis recombinant DNA Technology. Breakdown of purine and pyrimidine nucleotides.
- Biological Oxidation, Electron Transport Chain, Oxidative Phosphorylation.
- Hormones–Mode of Action, Regulation of Metabolism Biochemical parameters. Endocrinological abnormalities and clinical diagnosis.

C. <u>Food Microbiology, Sanitation And Hygiene (10 Marks):</u>

- Introduction to Microbiology – Mold, Yeast, Bacteria, Viruses, Protozoa, General Classification Family, Genus, Species. Study of their morphology, cultural characteristics and biochemical activities. Important microorganisms in foods, general.
- Growth curve of a typical bacterial cell – Effect of intrinsic and extrinsic factors on growth of organisms, pH, water activity, 0- R potential, nutritional requirements, temperature, relative humidity and gaseous environment.
- Primary sources of micro-organisms in foods – Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization.
- Fundamentals of control of micro- organisms in foods – Extrinsic and intrinsic parameters affecting growth and survival of organisms. Use of high and low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation, and use of preservatives in food. Storage of food correct handling and techniques of correct storage, Temperatures at which growth is retarded and bacteria are killed, Storage temperatures for different commodities to prevent growth or contamination and spoilage.
- Food spoilage and contamination indifferent kinds of foods and their prevention – Cereal and cereal products, pulses and legumes, Vegetables and fruits, Meat and meat products, Eggs and poultry, Milk and milk products.
- Public health hazards due to contaminated foods – Food poisoning and infections -Causative agents, symptoms, sources and mode of transmission, foods involved, Method of prevention, Fungal toxins, Investigation and detection of food-borne disease outbreak.
- Microbes used in biotechnology – Useful micro-organisms, Fermented foods – raw material used, organisms and the product obtained, Benefits of fermentation.
- Indices of food, milk and water sanitary quality. Microbiological criteria of food, water and milk testing. Food standards, PFA, FPO, BNS, MPO, Agmark, Codex Alimentarius.
- Hygiene and its importance andapplication – Personal hygiene – care of skin, hair, hands, feet, teeth, Use of cosmetics and jewellery, Grooming, Uniform, Evaluation of personal hygiene, Training staff.
- Safe handling of food – Control measures to prevent food borne diseases and precautions to be taken by food handlers. Reporting of cold, sickness, boils, septic wounds etc.
- Rodents and Insects as carriers offood-borne diseases. Control techniques.

- Disinfectants, sanitizers, antiseptic and germicide. Common disinfectants used on working surfaces, kitchen equipment, dish washing, hand washing etc. Care of premises and equipment, cleaning of equipment and personal tools immediately after use, use of hot water in the washing process.
- Waste disposal, collection, storage and proper disposal from the premises.
- Legal administration and quality control, laws relating to food hygiene.

D. <u>Human Nutrition and Meal Management (10 Marks):</u>

- Concept and Definition of terms – Nutrition, Malnutrition, Health, Brief history of Nutritional Science.

  Scope of Nutrition.
  Minimum Nutritional Requirements and RDA. Formulation of RDA and Dietary Guidelines – Reference Man and Reference Woman.
- Body Composition and Changes through the Life Cycle.
- Energy in Human Nutrition – Energy Balance, Assessment of Energy Requirements.
- Proteins – Protein Quality (BV, PER, NPU), Digestion and Absorption, Factors affecting protein bio-availability including Anti nutritional factors.
- Requirements.
- Lipids – Digestion and Absorption, Intestinal resynthesis of triglycerides – Types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, W-3)
- Carbohydrates– Digestion and Absorption. Blood glucose and Effects of different carbohydrates on blood glucose, glycaemic index.
- Dietary Fibre – Classification, Composition, Properties and Nutritional status significance.
- Minerals and Trace Elements – Physiological role, Bioavailability and Requirements.
- Vitamins– Physiological role, Bioavailability and Requirements.
- Water – Functions, Requirements.
- Nutritional requirements for different age groups with rationale. Factors affecting these requirements.
- Effect of cooking and home processing on digestibility and nutritive value of foods.

E. <u>Community Nutrition (10 Marks):</u>

- Improving nutritional value through different methods – germination, fermentation, combination of foods.
- Basic principles of meal planning.
- Nutritional considerations for planning meals for Adults – male and female, different levels of physical activity.
- Pregnancy and Lactation
- Feeding of young children 0 -3 years
- Old age
- Athletes
- Nutritional considerations in brief for the following: Military, naval perso$_{nnel}$
- Astronauts and food for space travel• Emergencies such as drought, famine, floods etc.
- Concept and Scope of Community Nutrition.
- Food availability and factors affecting food availability and intake.
- Agricultural production, post-harvest handling (storage & treatment), marketing and distribution, industrialization, population, economic, regional and socio-cultural factors. Strategies for augmenting food production.

- Assessment of Nutritional status – meaning, need, objectives and importance. Use of clinical signs, anthropometry, biochemical tests, and biophysical methods. Assessment of food and nutrient intake through recall, record, weighment. Food security and adequacy of diets.
- Use of other sources of information for assessment.
- Sources of relevant statistics.
- Infant, child and maternal mortality rates.
- Epidemiology of nutritionally related diseases.
- Nutritional problems of communities and implications for public health. Common Nutritional Problems in India. Incidence – National, Regional.
- Causes: Nutritional and Non Nutritional signs, symptoms, effect of deficiency and treatment
- PEM
- Micronutrient Deficiencies Fluorosis o Correction/Improvements in Diets 6. Schemes and Programs in India to combat Nutritional Problems in India. Role of International, National and Voluntary agencies and Government departments.
- Hazards to Community Health and Nutritional status
  - Adulteration in food
  - Pollution of water, air
  - Waste management
  - Industrial effluents, sewage
  - Pesticide residue in food
  - Toxins present in food – my cotoxins etc.
- Nutrition Policy of India and Plan of Action.
- Health and Nutrition Education – Steps in planning, implementation, and evaluations. Use of educational aids – visual, audio, audio-visual, traditional media etc.

F. <u>Diet Therapy (30 Marks):</u>

- Diet Therapy and Nutritional Care in Disease
  (i) The Nutritional Care Process
  (ii) Nutritional Care Plan
  (iii) Assessment and Therapy in Patient Care
  (iv) Implementation of Nutritional Care
- Nutritional Intervention– Diet Modifications
  (i) Adequate normal diet as a basis for therapeutic diets
  (ii) Diet Prescription
  (iii) Modification of Normal Diet
  (iv) Nomenclature of Diet Adequacy of Standard Hospital Diets
  (v) Psychological factors in feeding the sick person
- Interactions between Drugs, Food Nutrients and Nutritional Status
- Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements.
  (i) Drugs affecting intake of food and nutrients
  (ii) Absorption
  (iii) Metabolism and excretion
  (iv) Nutritional status
  (v) Summary of action of some common drugs
  (vi) Effect of food, nutrients and nutritional status on absorption and metabolism of drugs
- Disease of the G. I. System – Nutritional Assessment
- Pathogenesis of G.I. Disease with special reference to upper G. I. Tract and ulcers.
- Diseases of esophagus and dietary care
- Diseases of stomach and dietary care
- Gastric and duodenal ulcers
- Predisposing factors and Treatment

- Brief medical therapy, rest, antacids, other drugs and dietary care
- Food acidity, foods that cause flatulence, factors that damage G. I. Mucosa
- Foods stimulating G. I. Secretion
- Diet and Eating Pattern
- Diet Recommendations
- Liberal Approach Vs Traditional Approach
- Possible nutritional and dietary inadequacies
- Gastrostomy
- Intestinal Diseases
- Flatulence, Constipation, Irritable Bowel, Haemorrhoids,. Diarrhoea, Steatorrhoea, Diverticular disease, Inflammatory Bowel Disease, Ulcerative Colitis.
- Treatment and Dietary Care in the above mentioned conditions.
- Malabsorption Syndrome
- Celiac Sprue, Tropical Sprue
- Intestinal Brush border deficiencies (Acquired Disaccharide Intolerance)
- Protein Losing Enteropathy
- Dietary Care Process
- Diet in Diseases of the Liver, Pancreasand Biliary System
- Nutritional care in Liver disease in the context of results of specific Liver Function Tests.
- Dietary Care & Management in Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalophathy, Wilson's disease.
- Dietary care and management in diseases of Gall Bladder and Pancreas.
- Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis, Zollinger-Ellison Syndrome.
- Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycaemia Classification
- Physiological symptoms and disturbances, diagnosis (FBG and OGTT)
- Management of Diabetes Mellitus
- Clinical Vs Chemical control
- Hormonal Therapy
- Oral Hypoglycemic Agents
- Home Glucose Monitoring
- Glycosylated Hemoglobin
- Urine Testing
- Exercise
- Dietary care and Nutritional Therapy – The Diet Plan, Meal planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes
- Diabetes in Pregnancy, Elderly, Surgery, Diabetic diets in Emergency, Illness, Diabetic coma, Insulin reaction, Juvenile diabetes, Patient Education in Diabetes
- Hypoglycaemia -classification, symptoms, fasting state hypoglycaemia, Postprandial or reactive hypoglycaemia, Early alimentary and late reactive hypoglycaemia, Idiopathic hypoglycaemia, Dietary treatment in reactive hypoglycaemia.
- Dietary care in diseases of the Adrenal Cortex, Thyroid gland and Parathyroid gland.
- Functions of the gland and hormones and their insufficiency, metabolic implications, clinical symptoms.
- Dietary treatment as supportive toother forms of therapy
- Adrenal cortex insufficiency, Hyper and Hypothyroidism (goitre), Hypoglycaemia.
- Nutritional care for Weight Management
- Regulation of energy intake and balance of body weight
- Control of appetite and food intake–
  - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
- Identifying the obese
- Types of obesity, Health risks
- Causes, Psychology of obesity, Theories of obesity, Physiology of the obese state
- Thermogenesis, Thyroid hormones
- Treatment of Obesity
- Diets in Obesity – Starvation, Fasting

- Evaluation of some common diets, Protein-sparing modified fast, High protein diets
- Balanced Energy Reduction
- Foods to include, fibre foods allowed as desired, alcohol, snacks and beverages
- Psychology of weight reduction

- Behavioural Modification –
  - Psychotherapy, pharmacology, exercise & physical activity, Surgery, prevention of weight gain & obesity.
- Underweight– Etiology and Assessment, High calorie diets for weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia
- Diseases of the Circulatory System
  - Atherosclerosis – Etiology, risk factors, diet
  - Hyperlipidemias
  - Brief review of Lipoproteins and their metabolism
  - Clinical and nutritional aspects of Hyperlipidemias
  - Classification and Dietary care of Hyperlipidemias
  - Nutritional care in Cardiovascular disease
- Ischemic heart disease Pathogenesis of sodium and water retention in Congestive Heart Disease. Acute and Chronic Cardiac Disease, Acute
- Stimulants, food & consistency, Chronic – Compensated and decompensated states, Sodium Restriction in Cardiac Diseases, Diet in Hypertension – Etiology, Prevalence, Renin-
- Angiotensin mechanism, Salt and Blood pressure, Drugs and Hypertension, Cerebrovascular diseases and diet in brief)
- Anemia
- Resulting from Acute Haemorrhage
- Nutritional anaemia
- Sickle cell anaemia
- Thalassemia
- Pathogenesis and dietary management in the above conditions
- Renal Disease
- Physiology & function of normal kidney – a brief review
- Diseases of the kidney, classification
- Glomerulo nephritis – Acute and Chronic– Etiology, Characteristics, Objectives, Principles of Dietary
- Treatment and Management
- Nephrotic syndrome – objectives, principles of Dietary Treatment and Management.
- Uremia and Renal Failure
- History, General Principles of Protein
- Nutrition in Renal Failure and Uremia.
- Acute Renal Failure– Causes, dietary management fluid, sodium and potassium balance, protein and energy requirements
- Chronic renal failure medical treatment, Renal transplants. Dialysis and types haemodialysis, Peritoneal Dialysis & Continuous Ambulatory Peritoneal Dialysis (CAPD). Dietary Management in conservative treatment, dialysis and after renal transplantation.
- Use of Sodium and Potassium
- Exchange lists in Renal (diet planning). □ Chronic renal failure in patients with diabetes mellitus
- Chronic renal failure in children
- Nephrolithiasis – Etiology, types of stones, Nutritional care, alkaline-ash diets
- Allergy
- Definitions, symptoms, mechanism of food allergy
- Diagnosis– History, Food record
- Biochemical and Immunotesting (Brief)
- Elimination diets
- Food selection□ Medications (brief)

- Prognosis food Allergy in infancy
- Milk sensitive enteropathy; Colic, Intolerance to breast milk, prevention of Food Allergy.
- Diseases of Nervous System, Behavioural Disorders and Muscular Skeletal System
- Neuritis and polyneuritis
- Migraine, headache
- Epilepsy
- Multiple sclerosis
- Hyperkinetic Behaviour Syndrome Orthomolecular psychiatry and mental illness (Brief) Definition, etiology, dietary treatment and prognosis in the above conditions.
- Arthritis– Rheumatoid Arthritis, Osteoarthritis, Symptoms, dietary management
- Nutrition in Cancer- Types, symptoms, detection
- Cancer therapies and treatment – side effects and nutritional implications
- Goals of care and guidelines for oral feeding
- Accommodating side effects
- Enteral tube feeding – Nasogastric, Gastrostomy, Jejunostomy
- Parenteral Nutrition
- Paediatric patients with cancer
- The terminal cancer patient
- Nutrition in Physiological Stress
- Physiological stress and its effect on body, nutritional implications.
- Fevers and infections
- Surgery and Management of Surgical Conditions
- Parenteral Nutrition – Types, mode, and composition of feeds
- Tube feeding – Routes, modes, composition, care to be taken during feeding
- Dietary guidelines
- Burns

G. **<u>Nutrition Education and Dietetic Counselling (10 Marks)</u>:**

- Metabolic implications – nutritional requirement
- Management and nutritional care
- Nutritional Management of Patients with HIV, AIDS
- Nutritional Management – Counselling and Management
- Goals of care
- Timing of food presentation
- Guidelines for oral feeding anti-tumour therapy
- Accommodating taste changes
- External tube feeding
- Parenteral nutrition
- Patient co-operation
- Paediatric patients with cancer
- The terminal cancer patient
- Misconceptions in nutritional care
- Dietician as part of the Medical Team and Outreach Services.
- Clinical Information – Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.
- The Care Process – Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription, Motivating Patients, Working with – Hospitalized patients (adults, paediatric, elderly, and handicapped), adjusting and adopting to individual needs.

- Outpatients (adults, paediatric, elderly, handicapped), patients' education, techniques and modes.
- Follow up, Monitoring and Evaluation of outcome, Home visits vii. Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counselling, Terminating counselling, Education for individual patients, Use of regional language, linguistics in communication process, Counselling and education.

H. <u>Food Services Management (10 Marks):</u>

- Introduction to food services and catering industry, Development of Food Service Institutions in India, Types of Services as affected by changes in the environment. ii. Hospital food service as a speciality – Characteristics, rates and services of the food production, service and management in hospitals. Role of the Food Service Manager /Dietician.
- Organizations – Types of organizations and characteristics.
- Organizational charts.
- Catering Management Definition, Principles and Functions, Tools of Management Resources. Attributes of a successful manager.
- Approaches to Management Traditional, Systems Approach, Total Quality Management.
- Management of Resources – Capital, Space, Equipment and Furniture, Materials, Staff, Time and Energy, Procedures Physical facility design and planning. Equipment selection.
- Purchase and store room management – Purchase systems, specifications, food requisition and inventory systems, quality assurance.
- Human Resource Management
- Definition, Development and policies
- Recruitment Selection, Induction
- Employment procedures: Employee Benefits, Training and Development, Human Relations, Job description, Job specifications, Job evaluation, Personnel appraisal.
- Trade Union
- Negotiations and Settlement.
- Financial Management (in brief since there is a separate subject Food Cost and Quality Control) – Elements of Financial management, Budget Systems and accounting, Budget preparation.
- Food Production and Service Operations
- General Planning
- Preliminary planning
- Consideration of patients with specific nutritional and dietary needs, labour use and productivity.
- Flow pattern.

SYLLABUS FOR THE POST OF PERSONAL ASSISTANT

PART-I

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (20 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (20 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

PART-II

Skill Test in Stenography:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF RADIOGRAPHIC TECHNICIAN GRADE I

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Anatomy and Physiology (10 Marks):

- Structure of the body–cells, tissues. Musculoskeletal System: Skull, Vertebral column, Shoulder Girdle Bones of upper extremities, Bones of lower extremities, pelvis and its muscles, Ossification.
- Cardiovascular System: Heart–blood– Arteries–Veins.
- Lymphatic System: Circulation of Lymph, Lymph glands, Thoracic duct. Digestive System: Mouth–oesophagus– stomach–small intestines large intestines spleen Liver Gall bladder Pancreas.
- Respiratory System: Nose, Larynx Trachea-Lungs Bony-case.
- Nervous System: Brain-meninges ventricles-Spinal cord and nerves.
- Eye: Structure and its function.
- Ear: Structure and function.

- Surface Anatomy and Cross–sectional Anatomy.
- Reproductive System: Female & Male organs.
- Urinary System: Kidneys, Ureters, Bladder, Prostate and Urethra.
- Skin: Structure and its function.
- Endocrine System: Pituitary gland, Penial gland, Thymus gland, thyroid and parathyroid gland, suprarenal glands

F. Dark Room Techniques (10 Marks):

- Photographic Process: Light image, Image produced by radiation, Light Sensitive materials, latent image.
- Film Material: The structure of X–ray & Imaging films, Resolving power, Grains of films, sensitivity of film, contrast of films, Type of films.
- X–ray Film Storage: Storage of unexposed films.
- Screens: Construction of intensifying screens.
- Choice of fluorescent material.
- Intensification factor, Detail, Sharpness. Speed, Screen contact, care of intensifying screens, Types of Screens. Cassettes: Cassette designs, Care of cassette, mounting of intensifying screen in the cassettes, various types of cassettes.
- Safe Light: Constituents, filter, testing. Film Processing: Constituents of processing solution and replenishes.
- Factors affecting the development. Types of developer and fixer, Factors affecting the use of fixer. Silver recovery methods.
- Film Rising, Washing and
- Drying: Intermediate rinse–washing and drying.
- Film Processing Equipment: Manual and Automatic processing. Dark Room Design: Outlay and materials used.
- Radiographic Image: The sharpness, contrast, detail, definition, viewing conditions & artifacts.
- Miscellaneous: Trimming, identification of films, legends, records filing, report distribution.

G. General Physics (10 Marks):

- Elementary idea of thermionic emission, Electron–idea of mass and nature of charge, Coulomb's law, Electric field, Unit of potential.
- Ohm's law, Units of resistance, potential and current, Combination of resistance in series and parallel. Fuses, Units of electric power, Earthing of electrical equipment.
- Magnetic fields, Lines of force, Field pattern due to a straight current carrying conductor, coil carrying current, electromagnet, Construction and working of galvanometer, voltammeter and ammeter, (moving coil type and moving magnet type).Heat and methods of transference of heat, condensers, Inductance and Impedance. A.C. and D.C. currents-effective current, RMS value, peak value. Electromagnetic induction – Laws, fields, influence. Transformers – Principles, construction, and uses of step down and High tension transformers.
- Diode values and their use in rectifiers solid-state rectifiers, its various rectifying circuits uses in X– ray machines, production of X–rays and their properties, X–ray tube–Stationary anode and rotating anode & therapy tubes, X–ray circuit, interlocking circuits, relay and timers.

H. Radiographic Techniques (10 Marks):

- Upper Limb: Fingers individual and as a whole hands, Carpal bones wrists, Forearm, elbow–head of radius, humerus, shoulder joint, Acromioclavicular joint, scapula, sternoclavicular joint, small joints.
- Lower Limb: Toes, foot, calcaneum & other tarsal bones, ankle joint, legs, knees, patella, fibula, femur, intercondylar notch.
- Hip & Pelvis: Hip, Neck of femur, threatre procedure, for hip pinning or reduction, pelvis, sacro-iliac joints, pubic bones, acetabulum.

- Vertebral Column: Curves, postures, relative levels atlanto, occipital region, odontoid process, Cervical spine, thoracic Inlet, Cervico, thoracic spine,
- lumbosacral spine, sacrum, coccyscoliosis, kyphosis, flexion, extension and neutral.
- Bones of the thorax: Sternum ribs. Skull: Land marks, Cranium, facial bones, maxilla, mandible, zygoma, T.M.
- joints, mastoids, petrous bones, optic foramen, sells turcica, P.N.S.
- Chest: Chest in teleradiography, chest supine & portable, Lordotic, apicogram and MMR.
- Abdomen: Preparation, indication and contraindication, acute abdomen, pregnancy abdomen for multiplicity maturity and foetal abnormality.
- Pelvirnetry.
- Soft tissue: Neck and breast.
- Emergency Radiography: Bedside radiography, O.T. Radiography.
- Radiography for age evidence: Bone age evidence.
- Dental Radiography: Occlusal view, Dental X–ray, Panoramic view.

I. Radiographic Procedures (10 Marks):

- Pathology: Definition, cell growth, cell deformities, cell damage, defence mechanism, cell repair.
- Neoplasia: Benign & Malignant including its mode of growth and metastasis.
- Radiation: Local and systemic.
- Radiotherapy techniques.
- Emergency in Radiology.
- Contrast media.
- Urinary Tract: I.V.P., Retrograde Pyelography, Cystourethrography. Presacral Insufflation.
- Biliary Tract: Oral cholecystography, I.V.C, Trans hepatic percutaneous cholangiography preoperative cholangiography – T-tube cholangiography, E.R.C.P.
- Tomography: Principle, equipment and types of movements, procedure.
- Venography:
- Splenoportovenography, Peripheral venography.
- Lymphangiography.
- Marnmography and Xeroradiography.
- Radiculography.
- Dacrocystography.
- Gastro-intestinal Tract: Ba-swallow, Ba-meal upper G.I.T., Ba-meal follow throughs, Ba-Enema.
- Female Genital Tract: Hystero Salpingography, Gynecography, Placentography & Pelvimetry.
- Angiography: Carotid angiography,Femoral arteriography, Aortography, Selective angiography etc.
- CNS: Ventriculography,
- Myelography, Pneumoencephalography.
- Sialography
- Sinography
- Nasopharyngography
- Laryngography
- Bronchography
- Arthrography
- Discography

J. Radiation Physics and related equipments (20 Marks):

- Latent images formation and its processing.
- Various units used for measuring radiation–Roentgen, rad and rem. Construction of X–ray tube, X–rays–its production and properties.
- Ionization chambers, G.M. Counter and Scintillation Counter, Interaction of X– ray with matter.

- Quality and quantity of X–rays, HVT, linear absorption coefficient, Grid, Cones and Filters.
- Inverse square law, scattered radiations and appliances used to reduce it.
- II. Radioactivity
- Curie, Half-life, decay factor. Details about radium, cobalt and caesium.
- Doses–dose and dose rate, exposure dose, exit dose, surface dose, depth dose, isodose charts and their uses.

- Radiation Hazards, Protection against it, film badge, pocket ionization chamber, maximum permissible dose.
- High-tension control equipment – Diagnostic H.T. circuits, high tension generators, half wave full wave three phase, condensers discharge, contact voltage high tension switches, control and establishing equipment, tube filament supply, mains compensator mains resistance compensator. X-ray tubes – design, rating and care of X-ray tubes, practical considerations in choice of focus, inherent filtration. MAS meter elementary principles and construction, importance as check on. Radiographic results.
- Apparatus behaviour and additive tube loading, exposure timers – spring activated, synchronous motor, value (Low-tension ionization testing timer accuracy). Interlocks and safety devices. Circuits – Simple circuit diagram and illustration of sequence from mains supply to control X-ray exposure bean. Cantering devices – mechanical and optical, interaction of X-rays and the body transmission in body tissues. Scattered radiation – control of scattered radiation, cones, diaphragm, single and multiple filters grid ratio in relation to KV, construction and operation, focused and non – focused, single stroke reciprocating and oscillating potter – bucky, diaphragms, cress cross grids, stationary grids, use etc.
- Production of X-ray tubes and high tension circuits for the production of control panel and control safety device and interlocks, basic principles of mega voltage X-ray machines.
- Fluoroscopy – Tube filtration, diaphragm, tilting couch screen grid and exploratory and control safety devices, compressors, protection, electrical radiographic and mechanical control, use and care of couch accessory fittings. Special equipment – body section radiography, apparatus and controls simultaneous multi section accessories specialized couches, skull table, mobile units. Image intensifiers, principles, optical systems, for viewing and recording final image electrical and x-ray supply protection, applications, including cine radiography, mass miniature radiography, special radiography, equipment for high speed serial techniques (etc.) rapid cassette changer rapid films changer, roll films, full size and miniature, biplane equipment, grids, protection, problems of processing and presentation, care and maintenance – general principle and routine use of charts supplied by manufactures, radiographic calibration procedure.
- Hospital staffing and organisation, records relating to patients and departmental statistics, professional attitude of the radiographer to patients and other members of the staff, medico legal aspects, minimising waiting time, appointments organisation stock taking and stock keeping.
- Care of patient: - first contact with patient in the department handling of chair and stretcher patients, lifting of ill and injured patients, elementary hygiene, personal cleanliness, hygiene in relation to patients. E.g. clean linen and receptive nursing care, temperature. First Aid: - Shock, asphyxia, convulsions, artificial respiration, electric shock, burns, scalds,
- Haemorrhage, pressure point, tourniquet, fractures, splints, bandaging, foreign bodies, poisons, drug, reactions, administration of oxygen.
- Preparation of a patient for general X-ray examinations. Departmental instruction to out patients or ward staff, use of aperients, enema and colonic irrigation, flatulence and flatus causes and methods of relief, principles of catheterization and intubations, premeditation, its uses and methods, anaesthetised patients, nursing care before and after special X-ray examinations e.g. in neurological, vascular and respiratory conditions diabetic patients, special attention to food, trauma hazards.
- Preparation of patients for special x-ray examinations barium enema, barium meal, intravenous pyelography cholecystography etc. and their administration.
- Principles and aspects: - Methods of sterilization, care and identification of instruments and surgical dressings in common use, setting of trays and trolleys for various examinations etc.
- Intravenous pyelography, biopsy, elementary **operating** theatre produce. Drugs in department-storage, labelling checking, regulations **regarding**

- Contrast media- barium preparations, iodine
- Radiographic Photography:
- Photographic aspects of radiography– the fundamentals of the photographic process, light sensitive salts of silver, the photographic emulsion gelatin as suspension medium, size and frequency of the silver halide grain in relation to sensitively and contrast, formation of the latent image, chemical development, construction of x-ray film base material, substratum coating, emulsion, coating anti-abrasive super coating sensitivity, storage of unexposed film.
- X-ray materials: - Type of emulsion, characteristics and control screen films, non-screen films, dental films, comparative speed and contrast to light and x-rays.
- Characteristics of x-ray emulsions, characteristics curves of x-ray film assessment of the results of correct exposure under & over exposure, density (D max) speed, contrast
- (Gamma infinity) graduation, fog, grain, exposure, kilovoltage and developing latitude. Intensifying screens
- fluorescence application of fluorescence in radiography, construction of an intensifying screen, types of emulsion in relation to type of salt, size of grain, coating, weight, kilovoltage, mounting and general care of screens, after glow test for reciprocate failure, intermittency effect. X-ray, testing a cassette for proving good screen contact, general case of cassettes. X-ray developers –
- Characteristics and detail freedom from chemical fog and staining, long life possibility of degeneration.
- Standardization of quality of developers and development – function and constituents of an x-ray developer, standardization by time and temperature development latitude, exhaustion of a developer, replenishment of developers, ultra rapid developers, combined developer and fixer, fixers and fixing, hardening agent, time of fixation, exhaustion of a fixer, electrolytic silver recovery and fixer regeneration, rapid fixers, separate hardening. Rinsing, washing and drying – objects of rinsing and washing, methods, employed, methods of drying films, processing – preparation of solutions, available water supply, nature of mixing, vessels, order of mixing solutions, filtration, making stock solutions, storage of dry chemicals, storage of solutions, processing units, hangers, care of hangers, control of temperature by heating elements and thermostat, water mixer, by refrigeration, use of ice – film quality, ultra rapid processing, tank or dish units, stop bath rinse, wetting agents, after treatment of films. Automatic processing principles, procedure and regeneration of solutions. Knowledge of Atomic Energy
- Regulatory Board (AERB) regulations and rules.

K. <u>Specialized investigations (10 Marks):</u>

- Computed Tomography
- Principles of CT – Basic Physics
- Recent developments, applications etc.
- Positioning in CT
- Different types of contrast materials.
- Emergency treatment.
- Radiation hazards
- Disposal of unused matter. Magnetic Resonance Imaging Principle – Physics – Techniques –
- Types of coils – Basic term used in MRI Operations, Applications, etc.
- Positioning in MRI.
- Different types of contrast materials.
- Emergency treatment.
- MRI hazards.
- Factors affecting quality of imaging. Ultrasound
- Physics – Types of ultrasound – Techniques of ultrasound scanning in different parts – positioning and filming – Principles of Doppler effect and colour Doppler.

SYLLABUS FOR THE POST OF STOREKEEPER

A. General Intelligence and Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. the topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern folding & unfolding, Figural Pattern – folding and completion, indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thing, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

50% Questions from General Awareness: Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations as may be expected of any educated person. The test will also include questions relating to India especially pertaining History, Culture, Geography, Economic Scene, General Policy.

C. Quantitative aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ration & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work.

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Material Management (80 Marks):

Introduction to Materials Management: Objectives and Advantages of Materials Management. Interfaces of Materials Management: Internal and external interfaces. Organization for Material Management. Supply Chain Management: Concept, objectives of supply – production and distribution system, Role and Management of flow of material in supply chain management. Material Management Linkages: Linkages with other functional areas of Management i.e. Production, Accounting and Finance, Marketing, HRM, IT, TQM. A Brief discussion on the functions of each functional area of Management. Cost Involved in material management: Concept of costs and cost classification, specific costs associated with Material Management.

Storekeeping: Objectives and functions of storekeeping, location and layout of stores. Types of stores. Receipt of Materials: Receipt procedure, inspection and testing of materials, Rejection and Returns of materials. Forms used in receiving of materials like Material Received Note, Inspection

Report and Rejection Report etc. Passing of Bills/invoices for payment. Issue of Materials: Issue procedure and documents used, store records like bincard and store ledger, →pricing of material issues – different methods like FIFO, LIFO, Simple average, weighted average, standard price, Replacement / market price etc. Material loses: Meaning, accounting treatment and control of different type of material losses (waste, scrap, spoilage, defectives, obsolescence etc.). Store Handling Equipment: Advantages of using stores handling equipment, Types of handling equipment: manual and mechanical devices.

Purchase Procedure: Pre-purchase considerations, standard purchase procedure, post-purchase issues. Standard form used in purchasing like purchase requisition, tender / quotation documents, schedule of quotations, purchase order, follow-up order, cancellation of order, Bill of Materials etc. Special Purchase Systems – Forward Purchase, Tender purchase, Blanket order, zero stock, Rate contract etc. Price Forecasting: Price and Pricing impact, price negotiations and fixing. Purchasing under fluctuating prices, purchasing under uncertainty, Negotiations regarding quality, terms of contract, delivery, payment schedule, cash discount, quality considerations, etc. Public Buying: DGS&D Rate contract, GeM, GFR. Online Purchasing: Concept, advantages, procedure of online purchasing and current online purchase practices.

Buyer-seller Relationship: Importance of good buyer-seller relationship, Relation with supplier-policies and issues in relationship, Ethical issues in purchasing. Quality Control in Purchasing: Concept of Total Quality Management (TQM), Certification, Role of Material Management in TQM. Value Analysis and Value Engineering.

Business Correspondence: Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, Inter -office Memo, Notices, Agenda.

Inventories: Meaning, types of inventories, definition as per relevant accounting standard, Need and benefit of holding inventories, objectives of inventory management.

Financial Accounting: Nature and scope, Limitations of Financial Accounting. Basic Concepts and Conventions, Accounting Standards: Meaning, Significance, Generally Accepted Accounting Principles (GAAP). Accounting Process: From recording of transactions to preparation of final accounts. Rectification of errors and Bank Reconciliation statement. Depreciation Accounting: Meaning of depreciation, causes, objects of providing depreciation, factors affecting depreciation, accounting treatment including provision for depreciation accounting. Methods of deprecation: straight line method and diminishing balance method.

Work Study: Importance of work study – Method Study and Work Measurement Method Study: Method and Method Study – Need for Method Study – Procedure of Method Study – Principles of Motion Economy.

Work Measurement: Techniques of Work Measurement including Estimating, Stopwatch Time Study, Predetermined Time Standards, Synthetic Estimates of Work Times, Activity Sampling. Computation of Standard Time – Elements – Types of Elements – Performance Rating – Allowances – Need for Allowances – Types of Allowances TPM: Meaning and objectives of TPM; Methodology of TPM, gains of TPM.

Material Logistics: Concept and Importance of Material Logistics. Logistic Tasks: Follow-up of Order, Transportation, Warehousing, Inventory Control, Information Monitoring. Logistic Planning: Major Aspects and Factors. Transportation: A Brief Study of different modes of transport used for movement of materials, their relative advantages, disadvantages and suitability Warehousing: Concept of Warehousing (Warehouse, Depositor and Warehouseman), Elements and Functions of Warehousing. Types of Warehousing, Advantages of a Public Warehouse, Costs Associated with Warehousing,

Quality Management Concepts: ISO Certification. Methods of Control: Product, Process, Risk, Evolution, Management Approaches, Quality Management Support System. R Chart, P Chart and

X charts; Acceptance Sampling & OC Curve in production Control. Supply Chain Management: Supply management an organization spanning activity. How purchasing becomes supply management? Supply Management and the Bottom line. The four phases of supply management. (Generation of requirement, sourcing, pricing and post award activities). Supply management systems: B2B, Strategic Supply Management. Enabling Concepts in Supply: Buyer-supplier relationship: Developing and Managing collaboration and Alliance relationship. Cross-functional teams and supply-Management Activities. Challenges and problems with cross functional approach, ERP Systems, Negotiations and Bidding, Information sharing.

The Indian Contract Act, 1872: Contract – meaning, characteristics and kinds, Essentials of valid contract Discharge of contract – modes of discharge including breach and its remedies, Contingent contracts, Quasi contracts The Indian Contract Act, 1872: Specific Contracts : Contract of Indemnity and Guarantee, Contract of Bailment, Contract of Agency The Sale of Goods Act, 1930: Contract of sale, meaning and difference between sale and agreement to sell, Conditions and warranties, Transfer of ownership in goods including sale by non-owners, Performance of contract of sale, Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Partnership Law The Partnership Act, 1932: Nature and Characteristics of Partnership, Registration of Firms, Types of Partners, Rights and Duties of Partners, Implied Authority of a Partner, Incoming and outgoing Partners, Mode of Dissolution of Partnership.

The Limited Liability Partnership Act, 2008: Salient Features of LLP, Difference between LLP and Partnership, LLP and Company, LLP Agreement, Partners and Designated Partners, Incorporation Document, Incorporation by Registration, Partners and their Relations, winding up.

The Negotiable Instruments Act, 1881

Meaning and Characteristics of Negotiable Instruments: Promissory Note, bill of exchange, Cheque, Holder and Holder in due Course, Privileges of Holder in Due Course, Negotiation: Types of Endorsements, Crossing of Cheque, Bouncing of Cheques
Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management. Evaluation of Material Management Function: Meaning and Procedure. Evaluation Tools and Techniques.
Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management. Evaluation of Material Management Function: Meaning and Procedure. Evaluation Tools and Techniques.

F. Basic Knowledge of GeM (10 Marks)

G. Statistics (5 Marks):

- Collection of Data
- Measures of Central Tendency
- Measures of Dispersion
- Correlation & Regression
- Index Numbers
- Use of Statistical Tool
- Bar Graph, Line Charts, Pie-Charts, Venn Diagram
- Percentile Rank and Quartile Rank
- Data Interpretation
- Central Tendency, Dispersion, deviation, variance
- Skewness & Kurtosis

SYLLABUS FOR THE POST OF ARTIST (MODELLAR)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. **General Awareness (10 Marks):**

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like sin20 + Cos20=1 etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar- diagram, Pie-chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. **Subject knowledge (60 Marks):**

Introduction to Commercial Art and Fine Art

- What are applied art, commercial art, and fine art?
- How they are beneficial for a designer?
- Introduction of drawing tools
- Design brief and analysis
- Layouts- types and their uses
- Introduction to color schemes
- Creation of various stages in layouting – idea, rough, and finished
- Practical – abstract design with primary and secondary color scheme
- scrap file making

Still Life

- Overview of perspective
- Perspective drawing and composition
- Creating 3D objects
- Practical with colors
- Placement of objects
- Placing object in a composition
- Different types of shading
- Textures in shading
- Shading techniques and reflection
- Understanding shading – glass, steel, mud, clay, fruits, and vegetables etc.
- Objects Composition with colors

Design Elements and Principles

- Design Elements
  - Color
  - Shapes
  - Typography
  - Line
  - Form
  - Value
  - Texture
  - Space
  - Design Principles
  - Balance
  - Movement
  - Rhythm
  - Contrast
  - Pattern
  - Unity
  - Emphasis

Design Essentials

- Grid Systems
- Types of Layouts

Logo Designing

– Types of Logos and their Making

Idea Development, Concept Art, and Visualization

SYLLABUS FOR THE POST OF CASHIER

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language & Comprehension(10 Marks):

Candidates' ability to understand correct English, his basic comprehension and writing ability, etc. would be tested.

E. Basic Computers (10 Marks)::

a) General Computer Processing ability in MS-Office like Word Processing, Excel, PowerPoint etc. & Operating Systems.
b) Professional Software/Hardware System relevant to the Post.
c) Any other Computer/IT related questions.

F. Fundamental Principles and Basic Concepts of Accounting (80 Marks):

Financial Accounting - Nature and scope, Limitations of Financial Accounting, Basic Concepts and Conventions, Generally Accepted Principles. Basic Concepts of Accounting: Single and Double Entry System, Books of Original Entry, Bank Reconciliation, Journal, Ledgers, Trial Balance, Rectification of Errors, Manufacturing, Trading, Profit & Loss Appropriation Accounts, Balance Sheet, Distinction between Capital and Revenue Expenditure, Depreciation Accounting, Valuation of Inventories, Non-profit making organizations' Accounts, Receipts and Payments, Income & Expenditure Accounts, Bills of Exchange, Self-Balancing Ledgers.

SYLLABUS FOR THE POST OF DISSECTION HALL ATTENDANT

A. General Intelligence and Reasoning (25 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification ,Punched hole/pattern-folding & unfolding ,Semantic Series, Figural Pattern–folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de- coding, Other sub-topics, if any Numerical operations.

B. General Awareness (25 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (25 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like sin20 + Cos20=1 etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar- diagram, Pie-chart

D. English Language (25 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (25 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

SYLLABUS FOR THE POST OF DRIVER (ORDINARY GRADE)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

Questions on Driving Technique & Motor Car Mechanism shall aim at testing the candidate's knowledge of driving skills and procedures, duties of drivers, fuel efficiency and fuel economy, basic maintenance of the vehicle, servicing, emergency handling techniques, tools and documents required with the vehicle, types of vehicles, traffic Rules & Regulations, ability to recognize traffic signals, traffic signs, hand signals and road markings, simple queries about the assemblies of vehicle systems, etc. Basic Life Support and Knowledge of First AID, Pollution and Environment, Causes and types of accidents, Drivers responsibility in the event of accident, road rage and stress management, Basic knowledge of AIDS.

SYLLABUS FOR THE POST OF ELECTRICIAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.
- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, die and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions

- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

1. Meeting the Basic Needs of a patient
   (a) **Physical needs-**
      - Comfort, rest, sleep and exercise
      - Body mechanics- moving, lifting, transferring
      - Position and posture maintenance
      - Beds and Bed making – Principles of bed making, types and care of bed linen
      - Safety devices, restraints and splints'
   (b) **Hygienic needs**
      - Personal and environmental hygiene
      - Attendants role in maintaining personal and environmental hygiene

(c) **Elimination needs**

- Problems- constipation and diarrhoea, retention and incontinence of urine
- Offering bed-pan, urinal.

2. First Aid- Definition, Aim and Importance, rules/general principles of First Aid, first aid in emergencies
3. Procedures and Techniques in First Aid
   - Preparation of first aid kit
   - Dressing, bandaging and splinting etc.
   - Transportation of the injured
   - CPR and Basic Life Support.

SYLLABUS FOR THE POST OF JUNIOR ADMINISTRATIVE ASSISTANT

PART-I

A. General Intelligence and Reasoning (50 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification ,Punched hole/pattern-folding & unfolding ,Semantic Series, Figural Pattern–folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de- coding, Other sub-topics, if any Numerical operations.

B. General Awareness (50 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (50 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like sin20 + Cos20=1 etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar- diagram, Pie-chart

D. English Language (50 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

PART-II

Skill Test:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF JUNIOR WARDEN (HOUSE KEEPER)

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification ,Punched hole/pattern-folding & unfolding ,Semantic Series, Figural Pattern–folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de- coding, Other sub-topics, if any Numerical operations.

B. General Awareness (20 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (20 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

SYLLABUS FOR THE POST OF LAB ATTENDANT GRADE II

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

a. Biomedical Waste Management
b. Infection Prevention and Control
c. Basic Medical Terms
d. Common Laboratory associated Hazards & Bio-safety measures.
e. Concept of Quality care in laboratory
f. Quality Improvement Tools
g. NABH Guidelines
h. Basic Biochemistry including Normal values
i. HIV, Hepatitis-B and Hepatitis-C, Pre and Post exposure guidelines.
j. Medical Ethics
k. Basic Anatomy and Physiology

SYLLABUS FOR THE POST OF MANIFOLD TECHNICIAN (GAS STEWARD)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (60 Marks):

1. Gas Distribution Systems: Compressed gas cylinders, Colour coding, Cylinder valves; Pin index, Gas piping system, Recommendations for piping system, Alarms & safety devices.
2. MGPS Design and Techniques: Statutory obligations and safe system operation, MGPS design and installation requirements, Basic fault-finding, Structure and management of the permit-to work system, MGPS equipment performance requirements (plant and pipeline); Technical reporting including system capacities/limitations, upgrading requirements/equipment replacement, system compliance.

3. MGPS Policies and documentation: MGPS documentation; Emergency procedures; MGPS operational policy preparation, implementation and monitoring; MGPS testing and quality control requirements; Manifold systems; Cryogenic liquid cylinders; Bulk cryogenic (VIE) systems Alarm requirements.
4. Piping materials and specification of W.I. & steel pipes, Pipe threads, Pipe fittings, Specifications of fittings, Brief description of different types of pipe joints, Pipe fittings, Flanges, Unions, Valves etc., Different types of pipes lay out systems, Different types of pipe joints.
5. Working principals of valves and their description.
6. Mechanical faults on terminal outlets, Line regulators, Zone valve boxes and faults on electrically controlled line, Pressure alarms.
7. Oxygen acetylene welding procedure of medical gas pipeline using inert gas shielding
8. Installation, maintenance and repair of liquid oxygen plant and high-pressure cylinder manifolds
9. Types of many gas manifolds.
10. Manifolds selection criteria.
11. Manifolds assemblies.
12. Semi- automatic manifolds.
13. Manifolds accessories.
14. Manifolds valves etc.

SYLLABUS FOR THE POST OF MECHANIC (AIR CONDITIONING & REFRIGERATION)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject knowledge (40 Marks):

General - Knowledge of Indian Electricity Act, Indian Elect. Rules as amended up-to date. General conditions of supply and charges to be paid to licences for obtaining connection. CPWD General Specifications for Electrical Works, Principles of analysis of rates. General Principles in preparation of estimates, project reports, award of works and execution of works and measurement. ISI/BIS Standards and Codes of practices.

Internal Electrical Installations -

Systems of wiring and their design, distribution system. Apparatus for control, protection and Testing.

Earthing, Lighting Protection, Safety & Maintenance -

Necessity of earthing, earthing resistance, type of earthing. Lighting protection design, layout, material and installation. Safety procedures and practices, principles of equipment installation, preventive maintenance and testing of equipment.

Sub-Station up to 33 KV and Distribution -

Layout and Design for indoor and outdoor application. Specifications for equipment, Sub- Station earthlings, stand-by generating sets, commissioning procedures and tests. Distribution: Design of overhead line and underground distribution systems. Specification for cables, conductors, Supports etc. Cable joining and termination methods, power factor improvement, service connection to buildings.

Air-Conditioning Ventilation -

General principles of Refrigeration, Air-conditioning, evaporative cooling and ventilation, Heating and cooling load estimation. Classification of systems, their design and application, structural requirements, specifications for installations.

Water Supply -

Types of pumps and their characteristics. Prime movers, pumping systems and application. Specification for equipment and installation.

ELECTRICAL APPARATUS-

(i) Single and poly phase A.C. Circuit. Effects of resistance inductance and capacitance.

(ii) Single and poly phase transformers– constructional features, equivalent circuits performance, parallel operation, phase conversion. Separation of losses and determination of efficiency by various methods. Auto transformers.

(iii) Alternators, Constructional features, regulation, parallel operation and Protection. Automatic Voltage regulators, Emergency generating sets, automatic change over.

(iv) Induction machines, polyphasemotor and its principle of operation and equivalent circuit. Torque, slip characteristics. Crawling, methods of starting, single phase motor, its theory, characteristics and application.

INSTRUMENT TRANSFORMERS, PROTECTIVE RELAYING, MEASUREMENTS -

Current, Voltage transformers. Constructional features of IDMT relays, instantaneous relays including knowledge of overload earth fault, undervoltage, Bucholz relays. Connection diagrams, settings. Electrical instruments and Measurements, principles of construction and theory of measuring instruments for direct and alternating currents. Commercial types. Measurement of resistance, Voltage, current, power, power factor and energy. Watt meters, energy meters. Thermos couples, Resistance Thermometers, Pyro-meters. Fault locating bridges for cables. Measurements of resistance, inductance and capacitance, Wheatstone bridge.

INTERNAL COMBUSTION ENGINES

Fuels and Combustion. Fuels and their properties, combustion calculations. Analysis of products of combustion. Power cycles. Vapor power cyclesCarnot and Rankine. Gas Power- Otto and Diesel cycles. Deviation of actual cycles from theoretical cycles. Internal combustion engines – Two and four stroke compression ignition and spark ignition engines. Combustion phenomena. Detonation, Knocking, scavenging of two stroke engines. Fuel injection and carburation. Lubrication and cooling system performance and testing of IC engines. Pollution control requirements/standards.

HEATING, AIR CONDITIONING AND REFRIGERATION

Refrigeration – Refrigeration and heat pump cycles. Vapour compression, absorption Cycles. Refrigerants and their characteristics. Air Conditioning – Psychrometric chart, comfort air-conditioning, comfort indices, ventilation requirements. Cooling and dehumidification methods. Industrial air-conditioning processes. Different methods of electric heating. Construction and performance of Electric heating equipment.

WORKSHOP TECHNOLOGY

Estimation of power and energy requirements of electric welding, different types of equipments used and their characteristics. Manufacturing and Fabricating methods
and practices for various electrical and mechanical equipment such as pumps, switch boards, light fittings, AHUs etc.

ENERGY CONSERVATION, POWER FACTOR IMPROVEMENT

Comparison of different types of lamps from the point of energy conservation, calculation of payback period. Power factor improvement, Reduction of load current and transformer losses due to power factor improvements. KVA requirement for power factor improvement.

SOLAR ENERGY UTILISATION

Solar Hot Water system, principles, constructional features, constituent parts, installation, operation & maintenance, solar photo voltaic system, advantages/disadvantages of solar heating & solar photo voltaic system.

GENERAL SPECIFICATION OF AIR-CONDITIONING, REFRIGERATION & VENTILATION:-

Execution of installation, drawings and manual, air conditioning equipment, duet work, air handling and treatment, automatic control, general control and monitoring systems, general refrigeration machine, electric motors and electrical equipment noise vibration control, pipe work, valves, cocks and strainers, system monitoring instruments, thermal insulation, unitary air conditioners, water handling equipment, indoor air quality (IAQ), inspection and commissioning, operation and maintenance, painting, finishing and protective treatment.

SYLLABUS FOR THE POST OF OPERATOR (E&M)/LIFT OPERATOR

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres,Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (Electrical) (20 Marks):

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.
- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, die and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

F. **Subject Knowledge (Mechanical) (20 Marks):**

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.
- Conservation of Energy
- Engineering Materials
- Mechanics of Solids
- Workshop Technology
- Hydraulics and Pneumatics
- Theory of Machines
- Preventive Maintenance of machines
- Design and Estimation
- Production Technology
- Advanced Manufacturing Processes
- Industrial Engineering and Safety
- Metrology and Measuring Instruments
- Repair and Maintenance
- Disaster Management and Safety
- Introduction of fitting trade. Marking tools; callipers Dividers, Surface plates, Angle plates, Scribers, punches, surface gauges Types, Uses, Care and maintenance. Use of different bench tools used by sheet metal worker. Description and types of taps and dies, Description of marking and cutting tools such as snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Types of rivets and riveted joints. Use of thread gauge. Different types of threads. Materials, fluxes and process. Care and maintenance of tools. Introduction to thermometers, pressure gauges etc.

Subject Knowledge (100 Marks):

Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.

Metrology-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products .Use of allegation method in calculations, Isotonic solutions.

Packaging of pharmaceuticals-Desirable features of a container and types of containers. Study of glass &plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging.
Size reduction, objectives, and factors affecting size reduction, methods of size reduction- study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.

Size separation-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.

Mixing and Homogenization-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.

Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, sintered filters, Filter candles, Metafilter.

Extraction and Galenicals-

(e) Study of percolation and maceration and their modification, continuous hot extraction-Application inthe preparation of tinctures and extracts.
(f) Introduction to Ayurvedic dosage forms.

Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.

Distillation-Simple distillation and Fractional distillation, steam distillation and vacuum distillation. Study of vacuum still, preparation of purified water I.P. and water for Injection I.P. construction and working of the still used for the same.

Introduction to drying process-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and FreezeDryer.

Sterilization-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process.
Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration andGaseous sterilization.

Aseptic techniques-Applications of sterilization process in hospitals particularly with reference to surgicaldressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

Processing of Tablets-Definition; different type of compressed tables and their properties. Processesinvolved in the production of tablets; Tablets excipients ; Defects in tablets; Evaluation of Tablets; Physicalstandards including Disintegration and Dissolution. Tablet coating-sugar coating; films coating, enteric coating and micro-encapsulation (Tablet coating may be de.. in an elementary manner).

Processing of Capsules-Hard and soft gelatin capsules; different sizes of capsules; filling of

capsules; handling and storage of capsules. Special applications of capsules.

Study of immunological products like sera, vaccines, toxoids & their preparations.

PHARMACOGNOSY

1. Definition, history and scope of Pharmacogonosy including indigenous system of medicine.
2. Various systems of classification of drugs and natural origin.
3. Adulteration and drug evaluation; significance of pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

(a) **Laxatives**- Aloes, Rhubarb, Castor oil, Ispaghula, Senna.
(b) **Cardiotonics**- Digitalis, Arjuna.
(c) **Carminatives & G.I. regulators**- Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom,Ginger, Black pepper , Asafoetida, Nutmeg, Cinnamon, Clove.
(d) **Astringents**- Catecheu.
(e) **Drugs acting on nervous system**- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra,Opium, Cannabis, Nux -vominca.
(f) **Antihypertensive**- Rauwolfia.
(g) **Antitussives**- Vasaka, Tolu balsam, Tulsi.
(h) **Antirheumatics**- Guggal, Colchicum.
(i) **Antitumour**- Vinca.
(j) **Antileprotics**- Chaulmoogra oil.
(k) **Antidiabetics**- Pterocarpus, Gymnema sylvestro.
(l) **Diuretics**- Gokhru, Punarnava.
(m) **Antidysenterics**- Ipecacuanha.
(n) **Antiseptics and disinfectants**- Benzoin, Myrrh, Neem, Curcuma.
(o) **Antimalarials**- Cinchona.
(p) **Oxytocics**- Ergot.
(q) **Vitamins**- Shark liver oil and Amla.
(r) **Enzymes**- Papaya, Diastase, Yeast.
(s) **Perfumes and flavoring agents**- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandalwood.

Pharmaceutical aids-Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guargum, Gelatin.

Miscellaneous- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankhpushpi, pyrethrum,Tobacco.

Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwalfia,Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings-cotton, silk,wool and regenerated fibers.

Gross anatomical studies of-senna,Datura, cinnamon, cinchona, fennal, clove, Ginger, Nuxvomica & ipecacuanha.

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Introduction to biochemistry. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

Carbohydrates: Brief chemistry and role of carbohydrates, classification, qualitative tests, Diseasesrelated to carbohydrate metabolism.

Lipids: Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to

lipidsmetabolism.

Vitamins: Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in lifeprocesses.

Enzymes: Brief concept of enzymatic action. factors affecting it.

Therapeutics: Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in healthand disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

HUMAN ANATOMY AND PHYSIOLOGY

Scope of Anatomy and physiology. Definition of various terms used in Anatomy. Structure of cell, function of its components with special reference to mitochondria and microsomes.

Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connectivetissue and nervous tissue.

Skeltal System: Structure and function of Skelton .Classification of joints and their function. Joint disorders.

Cardiovascular System: Composition of blood, functions of blood elements. Blood group and coagulationof blood. Brief information regarding disorders of blood. Name and functions of lymph glands. Structure and functions of various parts of the heart .Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration.

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology of renal diseases and edema.

Muscular System: Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. physiology of neuromuscular junction.

Central Nervous System: Various parts of central nervous system, brain and its parts, functions and reflexaction. Anatomy and physiology of automatic nervous system.

Sensory Organs: Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

Digestive System: names of various parts of digestive system and their functions. structure and functionsof liver, physiology of digestion and absorption.

Endocrine System: Endocrine glands and Hormones. Location of glands, their hormones and functions. pituitary, thyroid. Adrenal and pancreas

Reproductive system: Physiology and Anatomy of Reproductive system.

HEALTH EDUCATION AND COMMUNITY PHARMACY

Concept of health: Definition of physical health, mental health, social health, spiritual health determinants of health, indicatory of health, concept of disease, natural history of diseases, the disease agents, concept ofprevention of diseases.

Nutrition and health: Classification of foods, requirements, diseases induced due to deficiency of

proteins, vitamins and minerals-treatment and prevention.
Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.
First aid: Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.
Environment and health: Source of water supply, water pollution, purification of water, health and air, noise, light-solid waste disposal and control-medical entomology, arthropod borne diseases and theircontrol. rodents, animals and diseases.
Fundamental principles of microbiology: Classification of microbes, isolation, staining techniques of organisms of common diseases.

Communicable diseases: Causative agents, mode of transmission and prevention. Respiratory infections- chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.
Intestinal infection-poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.
Arthropod borne infections-plague, Malaria, filariases.
Surface infection-Rabies, Tranchoma, Tetanus, Leprosy.
Sexually transmitted diseases-Syphilis, Gonorrhoea, AIDS.

Non-communicable diseases: causative agents, prevention, care and control.

Epidemiology: Its scope, methods, uses, dynamics of disease transmission. Immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

PHARMACEUTICS (Dispensing Pharmacy)

Prescriptions-Reading and understanding of prescriptions; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved indispensing.
Incompatibilities in prescriptions- study of various types of incompatibilities-physical, chemical and therapeutic.

Posology- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age,sex, surface area and veterinary doses.
Dispensed Medications: (Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. special labeling requirements and storage conditions should be high-lighted).
Powders-Type of powders-Advantages and disadvantages of powders, Granules, cachets and tablet triturates. preparation of different types of powders encountered in prescriptions. Weighing methods,possible errors in weighing, minimum weighable amounts and weighing of a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

Liquid oral Dosage forms:

Monophasic-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers,colorants and flavors, with examples.
Review of the following monophasic liquids with details of formulation and practical methods. Liquids forinternal administration Liquids for external administration or used on mucous membranes Mixtures and concentrates, Gargles
Syrups Mouth washes Throat-paints Elixirs

Douches	Ear Drops	Nasal drops
Sprays	Liniments	Lotions.

Biphasic Liquid Dosage Forms:

Suspensions (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant used like thickening agents, wetting agents, their necessity and quantity to be incorporated ,suspensions of precipitate forming liquids like tinctures, their preparations and stability. suspensions produced by chemical reaction. An introduction to flocculated /non-flocculated suspension system.
Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

Semi-Solid Dosage Forms:

Ointments: Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes:

Trituration	fusion
chemical reaction	Emulsification.

Pastes: Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation .
Jellies: An introduction to the different types of jellies and their preparation. An elementary study of poultice.
Suppositories and peassaries-Their relative merits and demerits, types of suppositories, suppository bases, classification, properties, preparation and packing of suppositories. Use of suppositories of drug absorption.

Dental and cosmetic preparations: Introduction to Dentifrices, facial cosmetics, Deodorants. Anti-per spirants, shampoo, Hair dressings and Hair removers.

Sterile Dosage forms:

Parenteral dosage forms-Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.
Sterility testing: particulate matter monitoring- Faculty seal packaging.

Ophthalmic products: study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

PHARMACEUTICAL CHEMISTRY

1. Introduction to the nomenclature of organic chemical systems with particular reference to hetero-cyclic system containing up to 3 rings.
2. The chemistry of following pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties(chemical structure of only those compounds marked with asterisk (*). The stability and storage conditions and the different type of pharmaceutical formulations of these drugs and their popular brand names.

Antiseptics and Disinfectants-Proflavine*, Benzalkonium chloride, Cetrimide, Phenol, chloroxylenol, Formaldehyde solution, Hexachlophene, Nitrofurantoin.

Sulphonamides-Sulphadiazine, Sulphaguanidine, Phthalylsulphathaizole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxypyridazine, Co-trimoxazole, sulfacetamide*

Antileprotic Drugs- Clofazimine , Thiambutosine, Dapsone*, solapsone,

Anti-tubercular Drugs- Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide*.

Antimoebic and Anthelmintic Drugs- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin , Piperazine*, Mebendazole ,D.E.C.*

Antibiotics- Benzyl penicillin*, Phenoxy methyl penicillin*, Benzathine penicillin, Ampicillin*, Cloxacillin, Carbencicillin, Gentamicin, Neomycin, Erythromycin, Tetracycline, Cephalexin, Cephaloridine, Cephalothin, Griseofulvin, Chloramphenicol.

Antifungal agents- Udecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

Antimalarial Drugs-Chloroquine*,Amodiaquine, Primaquine, Proguanil, Pyrimethamine*, Quinine, Trimethoprim.

Tranquilizers-Chlorpromazine*,Prochlorperazine,Trifluoperazine, Thiothixene,Haloperiodol*, Triperiodol, Oxypertine, Chlordizepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics-Phenobarbitone*,Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide*, Methyprylon, Paraldehyde, Triclofosodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopecal sodium, Trichloroethylene .

Antidepressant Drugs- Amitriptyline, Nortryptyline, Imperamine*, Phepelzine, Tranylcypromine.

Analeptics- Theophylline, Caffeine*, Coramine*, Dextro-amphetamine.

Adrenergic drugs- Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine, Salbutamol, Terbutaline,Ephedrne*, Pseudoephedrine.
Adrenergic antagonist- Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs- Neostigmine*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*.
Cholinergic Antagonists- Atropine*, Hyoscine, Homatropine, Propantheline*, Benztropine, Tropicamide,Biperiden*.
Diuretic Drugs- Furosemide*, Chlorothiazide, Hydrochlorothiazidc*, Benzthiazide, Urea*, Mannitol*,Ethacrynic Acid.
Cardiovascular Drugs- Ethylnitrite*, Glyceryl trinitrate, Alpha methyldopa, Guanethidine, Clofibrate,Quinidine.
Hypoglycemie Agents- Insulin, Chlorpropamide*, Tolbutamide, Glibenclamide, Phenformin*, Metformin. **Coagulants and Anti coagulants**- Heparin, Thrombin, Menadione*, Bisphydroxy-coumarin, Warfarin sodium.

Local Anaesthetics- Lignocaine*, Procaine*, Benzocaine,

Histamine and anti Histaminic Agents- Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine*, Pheniramine, Chlorpheniramine*,

Analgesics and Anti-pyretics-Morphine, Pethidine, Codeine, Mathadone, Aspirin*, Paracetamol, Analgin,Dextropropoxphene, Pentazocine.

Non-steriodal anti-inflammatory agents- Indomethacin*, Phenylbutazone*, Oxyphenbutazone, Ibuprofen.

Thyroxine and Antithyroids- Thyroxine*, Methimazole, Methyl thiouracil, Propylthiouracil.

Diagnostic Agents- Lopanoic Acid, Propyliodone, Sulfobromopthalein-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.
Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.

Steroidal Drugs- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.
Anti-Neoplastic Drugs- Actinomycin, Azathioprie, Busulphan, Chloramubucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochoride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

PHARMACOLOGY & TOXICOLOGY

Introduction to Pharmacology, Scope of Pharmacology.

Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

General mechanism of drugs action and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

Drugs acting on the central Nervous system:

General anaesthetics- adjunction to anaesthesia, intravenous anaesthetics. Analgesic antipyretics and non-steroidal

Anti-inflammatory drugs- Narcotic analgesics. Antirheumatic and anti-gout remedies.

Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics. Centrally acting muscle relaxants and anti-parkinsonism agents. Local anesthetics.

Drugs acting on autonomic nervous system.

Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs. Adrenergic drugs and adrenergic receptor blockers.

Neurone blockers and ganglion blockers. Neuromuscular blockers, used in myasthenia gravis.

Drugs acting on eye: Mydriatics, drugs used in glaucoma.

Drugs acting on respiratory system, Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

Autocoids: physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins.

Cardio vascular drugs

Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.

Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic , Blood substitutes and plasma expanders.

Drugs affecting renal function- Diuretics and anti-diuretics.

Hormones and hormone antagonists- Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives, corticosteroids.

Drugs acting on digestive system-carminatives, digest ants, Bitters, Antacids and drugs used in pepticulcer, purgatives and laxatives, Anti-diarrohoeals, Emetics, Anti-emetics, Antispasmodics.

Chemotherapy of microbial diseases:

Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti- tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs. Chemotherapy of protozoal diseases, Anthelmintic drugs. Chemotherapy of cancer.

PHARMACEUTICAL JURISPRUDENCE

Origin and nature of pharmaceutical legislation in India, its scope and objectives. Evolution of the "Concept of pharmacy" as an integral part of the Health care system.

Principles and significance of professional Ethics. Critical study of the code of pharmaceutical Ethics drafted by pharmacy council of India.

Pharmacy Act, 1948-The General study of the pharmacy Act with special reference to Education Regulations, Working of state and central councils, constitution of these councils and functions, Registration procedures under the Act.

The Drugs and Cosmetics Act, 1940-General study of the Drugs and cosmetics Act and the Rules there under. Definitions and salient features related to retail and whole sale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licenses under the rule. Facilities to be provided for running a pharmacy effectively. General study of the schedules with special reference to schedules C,C1,F,G,J,H,P and X and salient features of labeling and storage conditions of drugs.

The Drugs and Magic Remedies (objectionable Advertisement)Act, 1954-General study of the Act, objectives , special reference to be laid on Advertisements, magic remedies and objections1 and permitted advertisements -diseases which cannot be claimed to be cured.

Narcotic Drugs and psychotropic substances Act, 1985-A brief study of the act with special reference to its objectives, offences and punishment.

Brief introduction to the study of the following acts:
Latest Drugs (price control) order in force (as amended to date)

Medicinal and Toilet preparations (excise Duties) Act, 1955 (as amended to date**). Medical Termination of Pregnancy Act, 1971.**

DRUG STORE AND BUSINESS MANAGEMENT

Introduction-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

Drug House Management-selection of site, space Lay-out and legal requirements. Importance and objectives of purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto. Codification, handling of drug stores and other hospital supplies. Inventory Control-objects and importance, modern techniques like ABC,VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.

Sales promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.

Recruitment, training, evaluation and compensation of the pharmacist.

Banking and Finance-Service and functions of bank, Finance planning and sources of finance.

HOSPITAL AND CLINICAL PHARMACY

Hospital-Definition, Function, classifications based on various criteria,organization, Management and health delivery system in India.

Hospital Pharmacy: Definition Functions and objectives of Hospital pharmaceutical services. Location, Layout, Flow chart of materials and men.
Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

Drug Distribution system in Hospitals. Out-patient service, In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system, satellite pharmacy services, central sterile services, Bed side pharmacy.

Manufacturing: Economical considerations, estimation of demand.

Sterile manufacture-Large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

Non-sterile manufacture-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

Hospital Formulary system and their organization, functioning, composition.

Drug Information service and Drug Information Bulletin.

Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V.sets, B.G. sets, Ryals tubes, Catheters, Syringes etc.

Application of computers in maintenance of records, inventory control, medication monitoring, druginformation and data storage and retrieval in hospital retail pharmacy establishment.

Clinical Pharmacy:

Introduction to Clinical pharmacy practice- Definition, scope.

Modern dispensing aspects- Pharmacists and patient counseling and advice for the use of common drugs,medication history.

Common daily terminology used in the practice of Medicine.

Disease, manifestation and patho-physiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Physiological parameters with their significance.

Drug Interactions: Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.
Adverse Drug Reaction: Definition and significance. Drug-Induced diseases and Teratogenicity.

Drugs in Clinical Toxicity- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organo-phosphorus poisons.

Drug dependences, drug abuse, addictive drugs and their treatment, complications.
Bio-availability of drugs, including factors affecting it.

SYLLABUS FOR THE POST OF PLUMBER

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- Instruction to safety precautions on the shop floor
- Hardening and tempering of chisels
- Measurements wire gauge and sheet gauge
- Cutting of sheet metal of size

- Various tools and usage such as wrenches, spanners, caulking tools, stocks and dies etc.
- Leak proof joints for all types of pipes
- Knowledge of materials that go to form joints and be able to estimate requirements.
- Overhauling of bibcock's, ball valves, sluice valves including grinding and seating
- Preparation of sheet metal articles involving development
- Forming of rolls, welts corners & slashing in sheet.
- Joining of copper & Zinc of solids, hollow & conical roll.
- Erection of simple sen folding
- Marking for excavation
- Cement joining of pipes
- Joining of copper tubes :
    - Using can type compression fittings
    - Using ring type compression fittings.
    - Using capillary fittings.
- Butt and branch welds on M.S. pipes.
- Bronze welding
- Copper sheet
- Copper tubes
- Brass tubes to copper
- Installation meters.
- Gas meter
- Compound meter
- Hot water meter
- Joining practice on zinc and copper pipes
- Installation of gas piping
- Connection of gas meter
- Installation of gas appliances
- Use, care and maintenance of lifting tackle.
- Use of synthetic pipes e.g. polythene etc. and preparation of joints.
- Installation of bidet
- Trouble shooting
- Joining of cable line

Workshop Calculation and Science

- Algebra: Addition subtraction, multiplication and division of expressions involving algebraic symbols. Simple equations and transposition problems. Standard algebraic formula e.g. (a+b) (a-b) etc. simple simultaneous equation with two unknown quantities.
- Mensuration: Areas of rectangles, squares, triangles, circle and regular polygons, calculation of area, volume and eight of simple solid bodies such as cube spheres hexagonal prisms etc. problems.
- Trigonometry: Trigonometric functions. Use of trigonometric tables, applied problems. Calculation of areas of triangles, polygons etc.
- Further problems as applicable to the trade.
- Estimation preparation of estimates & specification.
- Meaning of ten city elasticity malleability, brittleness, hardness compressibility & ductility.
- Meaning of stress, strain, modulus of elasticity ultimate tensile strength, factor of safety and different types of stresses.
- Velocity and acceleration.
- Definition of mechanical advantage of simple machines pulleys
- Determination of diameters, length and weight of pipes. Calculation of requirement of

materials for the preparation of estimates. Head of water, water pressure per unit area, rate of flow and volume of water discharged.

- Description explanation of expansion of solids, liquids and gases due to heat, co-efficient of expansion. Brief description of transference of heat-conduction, convection and radiation.
- Heat and temperature. Thermometric scales, Fahrenheit and Celsius/centigrade scales, conversion of Fahrenheit to centigrade I Celsius scale and vice-versa. Measurement of temperature. Name and brief description of temperature measuring instruments used in the workshop.

Engineering Drawing

- Advance blue print reading
- Code of practice for general engineering drawing according to ISI (IS: 969)
- Development of surface of simple objects related to the trade.
- Construction of Isometric scale.
- Free hand sketching and production of working drawing of simple parts such as pipe joints, taps, valves etc.
- Free hand sketching and preparation of layout drawings of various plumbing details of buildings.
- Social Studies

SYLLABUS FOR THE POST OF SANITARY INSPECTOR GR. II

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

C. Subject Knowledge (80 Marks):

- Air Ventilation and Lightening
- Water
- Housing
- Septic Tanks
- Collection and disposal of refuse and excreta
- Disposal of the dead
- Food Sanitation
- Minor Sanitary Engineering
- Disposal of Sewage
- Drainage
- Public Health Administration
- Sanitary Laws
- Vital Statistics
- Rodent Control
- Files
- Vector Control
- First Aid
- Lice, Fleas, Ticks
- Animal Reservoirs of Disease
- Rain Water harvesting technique
- Different Water Purification Process
- Water Sanitation:
- Water: WHO's definition of environmental Sanitation. Safe and whole some water, Sources of water, various uses of water and its need. Water borne diseases, conservation source of water, quality of water, public health aspect of very hard water, Steps of disinfection of well. Physical, chemical and biological standard for portable water sources and nature of pollution of water in large scale and small scale. Process of disinfections of water in large and small scale provisions for sanitary wells and tube wells, plumbing system and its maintenance. Water supply and storage system at the community and domestic level, Sanitary inspection of water supply, Collection and despatch of water sample for chemical arsenic and bacteriological examination, Purification of water in urban area

- Air Sanitation: Concepts and importance of adequate ventilation.

- Night Soil Disposal: Solid Waste Disposal, Liquid Waste Disposal, Night Soil Disposal, Faucal borne disease due to unsanitary disposal of night soil, Different types of latrines in use principal of construction of sanitary latrines and their uses:
  (i) Bore hole (ii) Dug Well (iii) RCA (iv) Septic tank latrines
- Burial of Funeral Ground: Burial and cremation Ground and mass casualty Disposal
- Soil Sanitation
- Control of biological Environment: Housing Sanitation
- Occupational Health
- Disinfection & Sterilisation
- Control of Biological Environment:
  Study on insecticides, pesticides and disinfections, Sterilisation & disinfections of different articles, various spraying equipment's, Uses of rodenticides & larvaecidals.
- Housing: Requisites of satisfactory and safe housing, sanitary standards for construction of houses and provision of utility services, Assessment of overcrowding.
- Communicable Diseases: Introduction, Terminology, Modes of disease transmission, general measures for prevention & control of communicable diseases, Role of Health Worker.
- Immunity & Immunisation: Purpose, types & effects, National Immunisation schedule for prevention of major communicable diseases- BCG, DTP, Polio, Measles & Typhoid Vaccines.
- Disinfection & Sterilisation: Effective disinfection by liquid chemical agents like Halogen, Potassium per magnate solution etc. Solid chemical agent- Bleaching Powder, Lime etc.
- Non-Communicable Diseases: Diagnosis & Prevention
- Personal Hygiene: Factors influencing health & hygiene, Health habits & practice, Maintenance of normal circulation, respiration, digestion etc., Skin care cleanliness, Dental care, Care of hands, hand washing, Exercises-importance, Food values, Nutrition
- Health Statistics: Basic knowledge of statistics, mean, medium, mode, standard deviations. Sampling Procedure, Tabulation of Data, Histogram, Ogive, Pie Chart, Bar Chart.
- Public Health Acts: Indian Epidemic Diseases Act, Purification of Air and Water Pollution Acts, Prevention of Food Adulteration act, Birth and Death Registration Act, NTP Act, Suppression of Immoral Traffic Act (SITA), Municipal and local body Acts related to housing, sanitation etc. Factory Act and Employer's State Insurance Act.
- Public Health Administration: National Filaria Control Program, National Leprosy Program, Diarrheal Disease Control Program, STD Central Program, Goiter Control Program, Blindness Control Program, Universal Immunization Program
- Behavioural Science: Factors influencing human behaviour. Change of behavioural pattern in different age groups. Interpersonal relations and defence mechanism, Learning and motivation process in behaviour, Special groups and family structure, Social Process and control.
- Health Education:
  Elements of communication system and process, Use of audio visual aids and media, Teaching and Learning process, Planning Health Education activities, Health Education through personal contract, group meetings and indirect approaches, AIDS prevention.

SYLLABUS FOR THE POST OF STENOGRAPHER

PART-I

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. General Awareness (20 Marks):

Questions will be designed to test the ability of the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspects as may be expected of an educated person. The test will also include questions relating to India and its Neighbouring countries especially pertaining to Sports, History, Culture, Geography, Economic scene, General Polity including Indian Constitution, and Scientific Research etc. These questions will be such that they do not require a special study of any discipline.

C. English Language (80 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

PART-II

Skill Test in Stenography:

The Skill Test will be of qualifying nature. The candidates will have to appear for the stenography test. The candidates will be given one dictation for 10 minutes in English/Hindi at the speed of *80 w.p.m*. for the post of Stenographer.

SYLLABUS FOR THE POST OF STOREKEEPER-CUM-CLERK

A. General Intelligence and Reasoning (30 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. the topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern folding & unfolding, Figural Pattern – folding and completion, indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thing, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (30 Marks):

50% Questions from General Awareness: Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations as may be expected of any educated person. The test will also include questions relating to India especially pertaining History, Culture, Geography, Economic Scene, General Policy.

C. Quantitative Aptitude (30 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ration & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work.

D. English Language (30 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Material Management (80 Marks):

Introduction to Materials Management: Objectives and Advantages of Materials Management Supply Chain Management: Concept, objectives of supply – production and distribution system. Material Management Linkages: Linkages with other functional areas of Management i.e. Production, Accounting and Finance, Marketing, HRM, IT, TQM. Storekeeping: Objectives and functions of storekeeping, Receipt of Materials: Receipt procedure, inspection and testing of materials, Rejection and Returns of materials. Issue of Materials: Issue procedure and documents used, store records like bincard and store ledger, →pricing of material issues – different methods like FIFO, LIFO, Simple average, weighted average, standard price, Replacement / market price etc. Material loses: Meaning, accounting treatment and control of different type of material losses (waste, scrap, spoilage, defectives, obsolescence etc.). Store Handling Equipment: Advantages of using stores handling equipment, Types of handling equipment: manual and mechanical devices.

Purchase Procedure: Pre-purchase considerations, standard purchase procedure, post-purchase issues. Special Purchase Systems – Forward Purchase, Tender purchase, Blanket order, zero stock,

Rate contract etc. Public Buying: GeM, GFR. Online Purchasing: Concept, advantages, procedure of online purchasing and current online purchase practices.

Business Correspondence: Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, claim & adjustment letters and social correspondence, Memorandum, Inter -office Memo, Notices, Agenda, Minutes, Job application letter, preparing the Resume.

Logistic Planning: Major Aspects and Factors. Transportation: A Brief Study of different modes of transport used for movement of materials, their relative advantages, disadvantages and suitability. Road Transport: Consignment Note. Rail transport: Consignment Note. Air transport: Air Waybill, Contract of Affraightment. Warehousing: Concept of Warehousing (Warehouse, Depositor and Warehouseman), Elements and Functions of Warehousing, Types of Warehousing, Costs Associated with Warehousing,
Quality Management Concepts: ISO Certification. Methods of Control: Product, Process, Risk, Evolution, Management Approaches, Quality Management Support System. R Chart, P Chart and X charts; Acceptance Sampling & OC Curve in production Control Enabling Concepts in Supply: ERP Systems, Negotiations and Bidding, Information sharing.

Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management.

SYLLABUS FOR THE POST OF WIREMAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres,Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.

- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, die and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.
