

ADVERTISEMENT NO. CIPET/HO-AI/02/2023, dated 12.04.2023

**syllabus for the Written Test on 29th January 2024 for the Post of
Technical Assistant Grade – III
(Total – 100 Marks (MCQ)) – Time: 02 Hours**

EMPLOYABILITY SKILLS – 20 MARKS

S. No.	Topics to be Covered	Details
1.	Employability skills	<ul style="list-style-type: none"> • Basic English • Communication Skills • Computer Skills • General Knowledge • Reasoning

WORKSHOP CALCULATION & SCIENCE – 20 MARKS

S. No.	Topics to be Covered	Details
1.	Units and Fractions	<ul style="list-style-type: none"> • Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion Factors, HCF, LCM and problems Fractions - Addition, subtraction, multiplication & division Decimal fractions - Addition, subtraction, multiplication & division
2	Trigonometry	<ul style="list-style-type: none"> • Can use Trigonometric ratio and its table. Sine & cosine rule, Solutions of triangle, compound angles and multiple angles – able to solve simple problems. • Find unknown angles in any triangles, trigonometric ratios of multiple angles (2A & 3A) and problem solving the expansions
3.	Basic Science	<ul style="list-style-type: none"> • Centre of Gravity Centre of gravity - Centre of gravity and its practical application Area of cut out regular surfaces and area of irregular surfaces Area of cut out regular surfaces - circle, segment and sector of circle Related problems of area of cut out regular surfaces • Elasticity - Elastic, plastic materials, stress, strain and their units and young's modulus Elasticity - Ultimate stress and working stress • Mass, volume, density, weight and specific gravity Related problems for mass, volume, density, weight and specific gravity • Speed and Velocity, Work, Power and Energy- HP, IHP, BHP and efficiency • Heat & Temperature and Pressure- Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point of different metals and non-metals • Concept of pressure - Units of pressure, atmospheric pressure, absolute pressure, gauge pressure and gauges used for measuring pressure
4.	<ul style="list-style-type: none"> • Mensuration 	<ul style="list-style-type: none"> • Illustrate and name the parts of a circle, radius, diameter & circumference and using General equations of a Circle able to find centre, radius and equation of the circle. • Area and Circumference of 2D shapes with simple problems. Surface Areas & Volume of 3D shapes



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PROCESSING AND TESTING – 60 MARKS

S. No.	Topics to be Covered	Details
1.	Polymeric Materials	<ul style="list-style-type: none">• Simple polymer materials such as olefins, styrenic, vinyl, acrylic and characteristics.• Basic Knowledge of Engineering Plastics and Thermosets.
2	Processing	<ul style="list-style-type: none">• Basic Principles of Melt Processing of Thermoplastics• Introduction to Injection Moulding Process. Introduction about injection moulding machine – its types (plunger type, screw type).• Description about different types of injection Moulds and its parts. Processing defects, causes, remedies. Trouble shooting of injection moulding machine.• Microprocessor Controlled & PLC Injection Moulding machine.• Introduction to Compression Moulding Process. Compression moulding machine – (Hand operated & Semi automatic) its description, different parts and their respective functions.• Description about different types of compression Moulds and its parts. Processing Defects, Causes, and Remedies etc. Trouble shooting of Compression Moulding Machine. Transfer Moulding Process.• Introduction to Blow Moulding Process and its latest processing techniques. Blow moulding machine (Hand operated & Automatic) –its description, different parts and their respective functions. Sequence of operation.• Description about Blow Moulds and its parts. Processing defects, causes, remedies etc. Trouble shooting of Blow moulding machine• Introduction to different extrusion process and its latest processing techniques. Extrusion machine – its description, use of different parts and their functions. Description about extrusion dies and its parts. Processing defects, causes, remedies etc. Trouble shooting of extruder machine.• Post Moulding Operations: Annealing, Stress Relieving, Warpage, Control, De-flashing and Printing.• Importance of Predrying of Plastics Materials• Introduction about Oiling, lubrication and preventive maintenance of plastic processing moulding machine• Plastics recycling process and management
3.	Testing	<ul style="list-style-type: none">• Concepts of Testing- Specification and Standards, Test specimen preparation - Pre- conditioning and test atmosphere• simple techniques used for Material Characterization – Flow Behaviour, Density• Knowledge of short term and long term Mechanical property• Knowledge of HDT, VST, and Long Term Heat Resistant Tests.



CENTRAL INSTITUTE OF PETROCHEMICALS ENGINEERING AND TECHNOLOGY

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DESIGN AND TOOL ROOM – 60 MARKS

S. No.	Topics to be Covered	Details
1.	Engineering Materials	<ul style="list-style-type: none">Physical properties of engineering metal: colour, weight, structure, and conductivity, magnetic, fusibility, specific gravity.Mechanical properties: ductility, malleability hardness, brittleness, toughness, tenacity, and elasticity.
2.	Metrology	<ul style="list-style-type: none">Study of Limit, Fit and TolerancesGeometric dimensioning and tolerances.Describe Standards of Measurements., Need of Inspection, Measuring Instruments, Methods of measurement, and Requirements & General care of instruments, Accuracy and Precision.Surface plate - Introduction Material of Surface plate - Cast Iron & Granite, Sizes and Accuracy, Care, Use of surface plate & Procedure , Angle plate - Introduction, Sizes and Accuracy, Care, Use of angle plate & Procedure 'V' Block-Introduction, Care, Use of V blocks & Procedure Try square-Introduction, Care, Use of square & Procedure.Measuring Instruments - construction, application and least count. Steel rule, Callipers, Try square, Vernier callipers, and Vernier height gauges, Micrometres: outside & inside depth micrometre, height Master, Bore gauges, slip gauges & Pin Gauges
3	Engineering Drawing	<ul style="list-style-type: none">Geometrical constructions - Different geometric construction methods; line , arc, Circle, tangents ,regular polygons & conics sectionsOrthographic (first angle& third angle projection) and isometric views.Projection of Points, Lines and Planes and solidsDifferent sectional views, development of surfacesPerspective projections
4.	Workshop Technology	<ul style="list-style-type: none">Basic knowledge of working principle of Lathe, Drilling, Milling and Grinding machine, various parts of machine & their functioning and operating safety procedures.Use of various accessories & attachments for work holding & tool holding.Tools and its materials knowledgeBasic skills for various operations.Knowledge of calculating metal-cutting parametersKnowledge on CNC machine and programming