

**Syllabus for Computer Based Written Test for various
Non-executive Posts in S-7, S-5 & S-3 Grade w.r.t
Advt. no GAIL/OPEN/MISC/01/2022**

1. JR. ENGINEER (MECHANICAL)

<u>#</u>	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none"> - Basic Physics & Measurement systems like Vernier Callipers, Micrometers, Wire Gauge - Tool Box Management - Cutting & Threading - Scrapping and Abrasive Operations - Pipe Joints – Flanged or welding - Machining - Fire Fighting Equipment - Engineering mechanics (Preliminary) - Strength of materials (Preliminary) - Hydraulics and fluid mechanics (Preliminary) - Hydraulic Machines (Practical aspects) - Heat transfer, refrigeration and air conditioning(Preliminary) - Theory of Machines (Basics) - Workshop technology - Production engineering - Engineering Metrology and measurements - Machine design - Engineering Materials - Welding Science - Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

2. JR. ENGINEER (CHEMICAL)

<u>#</u>	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Fluid Mechanics- Stoichiometry / Material & Energy Balance- Petroleum refinery engineering- fertilizer Technology- heat transfer- mass transfer- chemical engineering thermodynamics- fuels and combustion- process control and instrumentation- furnace Technology- unit operations- Process Equipment & plant design- Process Technologies- Reaction Engineering
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

3. FOREMAN (ELECTRICAL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Fire Fighting Equipment- Basic Physics & Ohm's Law, Kirchoff's law etc.- Tool Box Management- Electrical Insulation- Electrical circuits and Fields- Electrical machines-Transformers, Generators, AC & DC Motors etc.- Electrical Power system- Electrical measurements and measuring instruments- Electrical Protection system- HT & LT Switchgear Panel & it's accessories- Winding technique- Wiring and lighting- Electrical earthing system- Battery Banks system- Power Electronics- Electrical Wiring and Jointing- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

4. FOREMAN (INSTRUMENTATION)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Fire Fighting Equipment- (Preliminary) Physics- Tool Box Management- Electrical Insulation- Basics of circuits and Measurement systems- Transducers, mechanical measurement and industrial instrumentation- Analog electronics- Digital electronics- Electrical and electronic measurements- Control system and process control including control valves, pressure safety valves etc.- Analytical, optical and biomedical instrumentation- Measuring instruments - Pressure gauges, temperature gauges, flowmeters, level gauges, pressure transmitters, temperature transmitters etc.- Calibration of instruments- Instrument tubings- PLC/DCS- Loop checking- P & ID diagrams- Electrical Wiring and Jointing- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

5. FOREMAN (MECHANICAL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Basic Physics & Measurement systems like Vernier Callipers, Micrometers, Wire Gauge- Tool Box Management- Cutting & Threading- Scrapping and Abrasive Operations- Pipe Joints – Flanged or welding- Machining- Fire Fighting Equipment- Engineering mechanics (Preliminary)- Strength of materials (Preliminary)- Hydraulics and fluid mechanics (Preliminary)- Hydraulic Machines (Practical aspects)- Heat transfer, refrigeration and air conditioning(Preliminary)- Theory of Machines (Basics)- Workshop technology- Production engineering- Engineering Metrology and measurements- Machine design- Engineering Materials- Welding Science- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

6. FOREMAN (CIVIL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">➤ Surveying<ul style="list-style-type: none">○ Plain Table Survey○ Theodolite Surveying○ Soil Survey and Analysis○ Chain Surveying➤ Cement Concrete and Reinforced Cement Concrete<ul style="list-style-type: none">○ Basics of Plain Cement Concrete (different grades)○ Basics of Design Mix Concrete (different grades)○ Reinforcement Steel (Weight Analysis & Composition of Steel)➤ Building Materials<ul style="list-style-type: none">○ Sand○ Aggregates○ Cement○ Bricks○ Water○ Bitumen➤ Material Testing<ul style="list-style-type: none">○ Concrete Testing○ Bricks Testing○ Aggregates Testing○ Bitumen Testing○ Steel Testing○ Soil Testing○ Water Testing➤ Plumbing & Sewerage<ul style="list-style-type: none">○ Waste Water Treatment○ Basic of Plumbing (Pipes & Flow Analysis)
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics))

7. JR. SUPERINTENDENT (OFFICIAL LANGUAGE)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Knowledge of Official Language policy and OL act 1963 and provisions thereof- OL rules 1976 and various provisions and rules framed under it- Comprehension in Hindi & English- Administrative terminology (Hindi & English)- Hindi literature- Hindi Grammar
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

8. JR. SUPERINTENDENT (HR)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- General Management & School of Management thoughts- Broad Functions of Personnel Management/ HRM (Function; Org. Structure; Manpower Planning; Recruitment & Selection; Wage & Salary Administration; Grievance Handling- Broad Functions of HRD (PMS; Training & Development; Workers Education Programmes; Training Effectiveness)- Organizational Behaviour & Organizational Development- Industrial Relations & Trade Unions (Participative Management)- Labour Laws (Objective; Principles; Evolution of Labour Law in India; Details on Factories Act 1948; ESI Act 1948; Employee Provident Fund & Miscellaneous Provisions Act 1952; Payment of Gratuity Act 1972; Employee Compensation Act 1923; Maternity Benefit Act 1961; Min. Wages Act 1948; Payment of Wages Act 1936 ; Contract Labour (Regulation & Abolition) Act, 1970; Industrial Disputes Act 1947; The Industrial Employment (Standing Orders) Act, 1946; Ind. Disputes Act 1947; Payment of Bonus Act 1965 etc.)- Disciplinary Proceedings- Information Technology (IT) and use of applications in HR (ERP; HR Analytics etc.)- Business Communication; Record Management; Data analysis & Interpretation
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

9. JR. CHEMIST

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Polymer chemistry- Inorganic chemistry- Physical chemistry- Organic chemistry- Water chemistry- Environmental Chemistry- Analytical chemistry- Group theory and spectroscopy- Principle of chromatography- Quantum chemistry- Testing equipment in Labs- Classification of elements
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

10. TECHNICAL ASSISTANT (LABORATORY)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Polymer chemistry- Basic chemistry- Environmental Chemistry- Analytical chemistry- Water chemistry- Group theory and spectroscopy- Principle of chromatography- Testing equipment in Labs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

11. OPERATOR (CHEMICAL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Atomic Mass, Atoms,- Gas Laws,- stoichiometry / Material and energy balance- Kinetic Theory of Gases- Laws of Equilibrium- Chemical Bonds & Chemical Thermodynamics- Vapor liquid equilibrium, Chemical reaction equilibrium- States of matter, Acids and Bases, Oxidation- Hydrocarbons, Petrochemicals, Distillation, Refining, exchange equipment, humidification operation, Refrigeration and liquefaction,- polymerization process technology, inorganic polymers- combustion process- Conductance, Electrochemistry- Electrical and Magnetic Properties of Atoms and Molecules- Basics of Organic Chemistry- Basics of unit operations
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

12. TECHNICIAN (ELECTRICAL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Fire Fighting Equipment- Basic Physics & Ohm's Law, Kirchoff's law etc.- Tool Box Management- Electrical Insulation- Electrical circuits and Fields- Electrical machines-Transformers, Generators, AC & DC Motors etc.- Electrical Power system- Electrical measurements and measuring instruments- Electrical Protection system- HT & LT Switchgear Panel & it's accessories- Winding technique- Wiring and lighting- Electrical earthing system- Battery Banks system- Power Electronics- Electrical Wiring and Jointing- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

13. TECHNICIAN (INSTRUMENTATION)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Fire Fighting Equipment- (Preliminary) Physics- Tool Box Management- Electrical Insulation- Basics of circuits and Measurement systems- Transducers, mechanical measurement and industrial instrumentation- Analog electronics- Digital electronics- Electrical and electronic measurements- Control system and process control including control valves, pressure safety valves etc.- Analytical, optical and biomedical instrumentation- Measuring instruments - Pressure gauges, temperature gauges, flowmeters, level gauges, pressure transmitters, temperature transmitters etc.- Calibration of instruments- Instrument tubings- PLC/DCS- Loop checking- P & ID diagrams- Electrical Wiring and Jointing- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

14. TECHNICIAN (MECHANICAL)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Basic Physics & Measurement systems like Vernier Callipers, Micrometers, Wire Gauge- Tool Box Management- Cutting & Threading- Scrapping and Abrasive Operations- Pipe Joints – Flanged or welding- Machining- Fire Fighting Equipment- Engineering mechanics (Preliminary)- Strength of materials (Preliminary)- Hydraulics and fluid mechanics (Preliminary)- Hydraulic Machines (Practical aspects)- Heat transfer, refrigeration and air conditioning(Preliminary)- Theory of Machines (Basics)- Workshop technology- Production engineering- Engineering Metrology and measurements- Machine design- Engineering Materials- Welding Science- Safety Gears & PPEs
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

15. TECHNICIAN (TELECOM & TELEMETRY)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Safety Gears & PPEs- Basic Physics & Electrical Engineering- Tool Box Management- Basics of Networking and Network Devices such as, Router, Switches, Modems- Motherboard, CPU, Memory- Electrical Wiring and Jointing- Basics of Communication systems – Wired and Wireless systems, OFC, Microwave etc.- UPS & Batteries- Basics of Power Electronics such as rectifiers, DC/AC converters etc.- GPRS, GSM, 3G, 4G- Mobile and Other Wireless Device (walkie talkie etc.) Communication- Network theory and Network protocol- Electromagnetic theory (Preliminary)- Control systems Basics- Basic Analog Electronics- Digital electronics Basics- Semiconductors Basics- Transistors Basics- Instruments and measurements Basics- Computer and microprocessor Basics- Amplifiers and oscillators- Linear and nonlinear analog circuits
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

16. OPERATOR (FIRE)

<u>#</u>	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Chemistry of Fire & Extinction Methods- Fire Extinguishing Mediums- Fire Hose & fittings- Ladders- Lines and knots- Fire Pumps & Hydrant System , water network- Portable Fire Extinguishers, small gears- Breathing Apparatus Set & BA Procedure- Basic First Aid & CPR- Electrical Fires- High Rise Building & Evacuation Methods- Fixed Fire Fighting Systems- Hydrocarbon Fire Fighting- Mobile Fire Appliances /Fire tender- Fire Ground Operation- Communication & mobilization- Control Room Operations & Procedure- Work Permit System- Rescue & search methods, Methods of entry and types- Fireman's Outfit & donning capability- Fire Drills- Personnel Protective Equipment
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

17. ASSISTANT (STORES & PURCHASE)

#	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Introduction to warehousing<ul style="list-style-type: none">○ Warehouse Operations○ Functions○ Centralized and decentralized○ Storage systems○ Warehousing cost analysis○ Warehouse layout- Inventory<ul style="list-style-type: none">○ Basic Concepts○ Functions○ Types○ Cost○ Need for inventory○ Just in time- Inventory Control<ul style="list-style-type: none">○ Inventory Control Techniques○ Requirement Planning- Principles and Performance measures of material handling systems<ul style="list-style-type: none">○ Fundamentals of material handling○ Material handling○ Various types of material handling requirement○ Warehouse (Temperature controlled)- Modern Warehousing<ul style="list-style-type: none">○ Automated storage and retrieval systems and their operations○ Barcoding technology and applications in logistics industry○ RFID technology and applications○ Advantages of RFID- Basic knowledge of tendering / procurement including evaluation of bids.
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

18. ACCOUNTS ASSISTANT

#	<u>Syllabus</u>	
<u>Part I</u>	➤ Accountancy	<ul style="list-style-type: none"> ○ Accounting concepts and conventions ○ Depreciation, Depletion and Amortisation (Concepts & Methods) ○ Inventory Valuation ○ Capital and Revenue expenditure/receipts ○ Bank Reconciliation Statement & Rectification of Errors ○ Lease/ Hire Purchase Accounting ○ Revenue Recognition
	➤ Basic of Mercantile Law	<ul style="list-style-type: none"> ○ Contract Act, 1872 ○ Sale of Goods act, 1930 ○ Negotiable Instruments Act, 1881
	➤ Company's Act 2013	<ul style="list-style-type: none"> ○ Accounts & Audit ○ Schedule II (Depreciation) ○ Schedule-III (Financial Statements) ○ CSR provision
	➤ Income Tax Act 1961	<ul style="list-style-type: none"> ○ Income Tax - Basic Concepts , Residential Status ○ Exempted Income and Income Tax Deductions(Chapter-VI A of Income Tax 1961) ○ Heads of Income (concepts & key provisions) ○ Provision relating to TDS & Forms to be filed with Income Tax Department
	➤ Goods & Services Act	<ul style="list-style-type: none"> ○ Fundamental Concepts of GST including ○ GST Input Tax credit provisions / documentations
	➤ Cost accounting & Management Accounting	<ul style="list-style-type: none"> ○ Cost Accounting basic – Material, Labour & Overhead ○ Fixed Cost & Variable Cost ○ Marginal & Relevant / Incremental Costing, Decision Making ○ Methods of Costing
	➤ Financial Management	<ul style="list-style-type: none"> ○ Basic Concepts ○ Financial Ratio Analysis
	➤ Computer (MS – Office) and financial packages proficiency	
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)	

19. MARKETING ASSISTANT

<u>#</u>	<u>Syllabus</u>
<u>Part I</u>	<ul style="list-style-type: none">- Marketing concept:<ul style="list-style-type: none">○ Core marketing concepts○ Segmentation, Targeting and Positioning,○ Product & Pricing,○ Promotion Mix○ Demand, Supply and Market equilibrium- Consumer Behaviour<ul style="list-style-type: none">○ Consumer Needs & Motivation, Perception & Attitudes○ Consumer Decision making process- Advertising Management<ul style="list-style-type: none">○ Advertising needs, importance and working○ Media planning & scheduling○ Offline & Online marketing strategies○ Brand management: Designing and implementing of brand strategies- Retail Marketing<ul style="list-style-type: none">○ Retail Marketing & Merchandising○ Supply Chain Management- Business & Management Accounting<ul style="list-style-type: none">○ Standard Costing- Business Laws<ul style="list-style-type: none">○ Indian Contract Act○ Sale of Goods Act○ Companies Act○ LC / Guarantee
<u>Part II</u>	General Aptitude Test (Viz. General Knowledge, Logical Reasoning, Current Affairs, Visual Reasoning, English Comprehension, Mathematics)

- There will be a total of 100 questions in the Computer Based Written Test. Each question has equal mark i.e. 1 mark per question and total of 100 marks.
- There will be negative marking in the written test. $\frac{1}{4}^{\text{th}}$ mark will be deducted for each wrongly answered question. No marks will be deducted for an attempted question.