



भारतीय प्रबंध संस्थान बोध गया  
उरुवेला, प्रबंध विहार, बोध गया - ८२४२३४, भारत  
Indian Institute of Management Bodh Gaya  
Uruvela, Prabandh Vihar, Bodh Gaya – 824234, India

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## **Syllabus for Written & Skill Test**

### **Junior Assistant (AC & Refrigerator)**

1. Numerical ability
2. Logical reasoning
3. General Awareness and Current Affairs
4. Verbal Ability (English Language based)
5. Computer competency in MS Office, Email, etc
6. Personal protection in the workplace.
7. Personal safety and prevention of accidents.
8. Basic First Aid
9. Safety sign for danger, warning, caution and personal safety message
10. Use of fire extinguisher
11. Electrical safety precautions
12. Hazards due to leakage of refrigerant and precautionary measures.
13. Hazards due to leakage of lubricant and water and precautionary measures.
14. Electrical Safety precautions
15. Use of PPE's during servicing of Refrigerator.
16. Types of Refrigerator and Air Conditioner and related terms
17. Various tools and Electrical Instruments Essential for Refrigerator and Air Conditioner Maintenance Tasks.

### **Building Management System Operator**

1. Basic communication skills.
2. Logical Reasoning
3. General Awareness
4. Basic Mathematics
5. Computer competency in MS Office, Email, etc
6. Handle operating BMS workstation & it's application.
7. Basic knowledge of Services like HVAC, Lifts, DG, Internal Electrical & Mechanical Installations, illumination systems etc.
8. Understanding of BMS Terminology & its Documentations.
9. Basics of Electrical panels, Power Supply, Controllers, Sensors and Actuators.



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## **Junior Assistant (Electrical)**

**PART-1:** The written test will be of 50 marks and Multiple Choice Question (MCQ) type and the duration of the test will be 60 Minutes.

**PART-2:** The Descriptive/Practical test will be of 50 marks and the duration of the test will be 90 Minutes.

**Aptitude:** Logical Reasoning and Verbal Ability - Verbal; Image-Based; Puzzle; Sequence

### **Core:**

1. **Basics of Mechanical Engineering** – Concept of mechanical technology – Milling, planning, shaping, drilling, reaming, grinding, riveting, welding and joining process – types, defects. Super finishing processes – Honing, lapping, buffing, Casting, forging, rolling, drawing, forming processes Classification, Selection and application of Machine Tools, Cutting tool material. Coolants, Design of cutting tools or Tool design.

2. **Theory of Machines** – Fundamentals and type of Mechanism, Simple machines, Belt Drives, Gear Drives, Joints and Coupling, single and multi-cylinder engines and v engines, belt and chain drives, degree of freedom.

3. **Refrigeration and Air Conditioning** –Ton of refrigeration, concept of latent heat, evaporation concept, Heat transfer Thermodynamics – Law of thermodynamics, Ideal Gasses, Various Refrigeration Cycles Design of Refrigeration system – Compressor, Expansion unit, Accumulator, Evaporator, Condenser, Basic of Duct design, Vapour Absorption and Compression Refrigeration system Design of Air Conditioning system – Types of system- Window, split, centralised., Cooling tower etc. Latest refrigeration and their examples.

4. **Electrical Fundamentals** – Supply voltage, AC and DC Supply, voltage, current, inductance, resistance, capacitance, 3 phase and 1 phase supply system, electrical power, electrical energy, hv/ Iv supply, active and reactive power transfer and distribution, Reactive power consumption, Basics of Nanotechnology, Power factor improvement, Energy conservation methods



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5. **Electrical power transmission & distribution** - Substation & receiving station, earthing, substation equipment, Bus Bar, CT, PT, Protection relay numerical / digital, circuit breaker, on load isolator, offload isolator, Surge arrestor, system grounding, equipment grounding, lightning protection etc. IS 3043, Single line diagram, control circuit, Various types of power plants.
6. **Insulating material** - Classification, dielectric strength, test & section (Bakelite, FRP, Teflon, PVC, HDPE, Mica, SF6, Vacuum, Oil etc).
7. **Electrical systems** – Electrification of residential installation, Electrification of Commercial installation, Electrification of Industrial installation
8. **Measurement and Control** – Basics of Measurement of Pressure, Temperature, Flow displacement etc.
9. **Cables and wires** - Types, construction, HV/LV cables, testing, fault finding, cable rating and selection, cable jointing, termination.
10. **Illumination (Light)** – Types of light, solar lighting, LED, CLF, HPSV, Mercury lamp, tube light etc.
11. **Principles of Digital Instruments** – Working principles of digital Voltmeter, Ammeter, Frequency meter, multimeters, Measurement of Resistance Megger Earth Test Potentiometer.
12. **Power Electronics** – SCR MOSFET, FET devices, rectifiers and inverter, SMPS, PWM convertor, application, Power amplifier 24 Batteries and UPS 25 Electrical protection – MCCB, ELCB etc.
13. **Concepts of Electronics** – Diode, Triode, Semiconductor, Forward bias, Reverse bias, Transistor – NPN, PNP. Analog circuits, Digital circuits
14. **Digital Electronics** - Logic Gates, De’Morgans Theorem, Boolean Logic, Counter, Adder, Flip flops and types
15. **SCADA** – Concept, Hardware, Software etc.



## **Electrician & DG Operator**

**PART-1:** The written test will be of 50 marks and Multiple Choice Question (MCQ) type and the duration of the test will be 60 Minutes.

**PART-2:** The Descriptive/Practical test will be of 50 marks and the duration of the test will be 90 Minutes.

**Aptitude:** Logical Reasoning and Verbal Ability - Verbal; Image-Based; Puzzle; Sequence

### **Core:**

#### **1. Fundamentals of Electricity: -**

Effects of electric current, fundamental terms, Definition, solder, flux, definition and properties of conductors, insulators, semi-conductors, different types of insulators, types of wires and cables, specification of wires and cables- insulators, low medium and high voltage, various types of cables Law of Resistance, Ohm's law, Kirchoff's laws- Resistance, PD, Current, specific resistance, laws of resistance, ohm's law, series and parallel circuit, kirchoff's laws, wheat stone bridge, effects of variation of temperature on resistance, work, power, energy, efficiency, heating effect of electric current.

#### **2. Cells and Batteries: -**

Electrolysis, Faraday's laws of electrolysis, basic principle of electro plating and electronic chemical equivalents, primary cell and secondary cell, lead acid cell, methods of charging care and maintenance of cells, grouping of cells of specified voltage and current, inverter, battery charger nickel alkali cell, efficiency of cells, power and capacity of cells.

#### **3. House Wiring and Earthing: -**

Different method of earthing, IE, Pipe, plate importance of earthing, improving Earth resistance, E LC B-type of wiring and their users, IE rules wiring accessories, such as lamp holder, switch, plug, bracket, ceiling rose, cut out, ICTP, ICDP. Illumination:- Construction working and application of incandescent lamp fluorescent tube cfl neon sign halogen Mercury vapour lamp sodium vapour lamp Magnetism:- Classification of magnets,



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methods of magnetising magnetic materials, properties, care and maintenance, para and diamagnetic, and ferro magnetic, materials principle of electromagnetism, Maxwell's cork screw rule, Fleming's left hand right hand rules, magnetic field of current carrying conductor, solenoid, MF, flux density, reluctance, hysteresis, 27 Eddy current, principle of electromagnetic induction, faraday's laws, lenz's law, electrostatics capacitor, different types of function and uses. 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.

**4. AC Generators/03 phase Motors and Starters: -**

Parts and construction of alternator principle of working, types of alternators, emf equation, various applications and power rating of alternator, general idea of loading and regulation of alternator, parallel operation of alternators, synchronising method AC single phase motor and types of capacitors, start/run, start and run. FHP motors and their uses various application of AC single phase motors.

**5. DG Operation and Maintenance: -**

Preventive & Corrective Maintenance, Tools & Equipment for maintenance, System Functions/ Operation, System Maintenance, etc.

**Note: -** *It may be noted that apart from the topics given above, questions from other topics related to the job and prescribed for the educational qualification of the post may appear in the question paper. There is no undertaking that all the topics above may be covered in the question paper.*