

Syllabus for written test for the post of Electrician

1. Occupational Safety and Health

Basic safety introduction, Personal protection. Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution and personal safety message. Use of Fire extinguishers. Visit and observation of sections. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard

2. Identification of Trade

Hand tools - Specifications, Uses and their care maintenance.

3. Fundamental of electricity

Electron theory - free electron, Fundamental terms, definitions, units and effects of electric current Explanation, Definition and properties of conductors, insulators and semi-Conductors Wires/cable & its specification. Types of wire joints & uses. Solders, flux and soldering technique. Brazing-Types & properties of resistors. Specific Resistance.

4. Ohm's Law

Simple electrical circuits and problems. Resistors-Laws of Resistance. Series, parallel and combination circuits. Kirchoff's Laws and applications. Wheatstone bridge principle and its applications. Effect of variation of temperature on resistance. Different methods of measuring the values of resistance.

5. Introduction of National Electrical Code

Voltage grading of different types of Insulators, Temp. Rise permissible. Types of wires and cables standard wire gauge. Specification of wires and Cables-insulation and voltage grades - Low , medium and high voltage Precautions in using various types of cables / Ferrules.

6. Common Electrical wiring Accessories –

Their specifications in line with NEC - Explanation of switches, lamp holders, plugs and sockets. Developments of domestic circuits, Alarm & switches, Use & specification of Fire alarm, MCB, ELCB, MCCB.

7. Chemical effect of electric-current-

Principle of electrolysis. Faraday's Law of electrolysis. Basic principles of Electroplating and Electro chemical equivalents. Explanation of Anodes and Cathodes. Cells -Primary & Secondary Lead acid cell-description, methods of charging-Precautions to be taken & testing equipment, Ni-cadmium & Lithium cell, Cathodic protection. Electroplating, Anodising. Different types of lead acid cells. Application of battery/cell in Inverter, Battery Charger, UPS, etc. Lead Acid cell, general defects and remedies. Nickel Alkali Cell-description charging. Power and capacity of cells. Efficiency of cells. Rechargeable dry cell, description advantages and disadvantages. Care and maintenance of cells. Grouping of cells of specified voltage and current, Sealed Maintenance free Batteries, Solar battery

8. Introduction of fitting trade.

Safety precautions to be observed Description of files, hammers, chisels hacksaw frames and blades -their specification and grades. Care and maintenance of steel rule, try square and files. Marking tools description and use. Description of carpenter's common hand tools such as saws planes, chisels mallet claw hammer, marking, dividing and holding tools - their care and maintenance.

9. Types of drills description and drilling machines

Proper use, care and maintenance. Description of taps and dies, types of rivets and riveted joints. Use of thread gauge.

10. Description of marking and cutting tools

Snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Different types soldering materials, fluxes and process. Types of different soldering irons and their proper uses. Use of different bench tools used by sheet metal worker.

11. Magnetism –

Classification of magnets, methods of magnetising, magnetic materials. Properties, care and maintenance. Para and Diamagnetism and Ferro magnetic materials. Principle of electromagnetism, Maxwell's corkscrew rule, Fleming's left and right hand rules, Magnetic field of current carrying conductors, loop and solenoid.MMF, Flux density, reluctance. B.H.curve, Hysteresis, Eddy current. Principle of electro-magnetic Induction, Faraday's Law, Lenz's Law. Electrostatics: Capacitor-Different types, functions and uses.

12. Alternating Current -

Comparison and Advantages D.C and A.C. Related terms Frequency Instantaneous value, R.M.S. value Average value, Peak factor, form factor. Generation of sine wave, phase and phase difference. Inductive and Capacitive reactance Impedance (Z), power factor (p.f). Active and Reactive power, Simple problems on A.C. circuits, single phase and three- phase system etc. Problems on A.C. circuits. Power consumption in series and parallel, P.F. etc. Concept three-phase Star and Delta connection. Line and phase voltage, current and power in a 3 phase circuits with balanced and unbalanced load

13. Earthing -

Principle of different methods of earthing. i.e. Pipe, Plate, etc Importance of Earthing. Improving of earth resistance Earth Leakage circuit breaker (ELCB). In absence of latest revision in respective BIS provision for Earthing it is recommended to follow IEC guidelines.

14. Basic electronics-

Semiconductor energy level, atomic structure 'P' type and 'N' type. Type of materials –P-N-junction. Classification of Diodes–Reverse and Forward Bias, Heat sink. Specification of Diode PIV rating. Explanation and importance of D.C. rectifier circuit. Half wave, Full wave and Bridge circuit. Filter circuits-passive filter.