

Sr. No. 13

SYLLABUS FOR ELECTRICIAN- G-II

1. Electricity and its uses, electric current, Use of switches and fuses. Conductors and insulators.
2. Fundamental of electricity, electron theory, free electrons, fundamental terms, definitions, units & effects of electric current.
3. Solders, flux and soldering technique. Resistors types of resistors & properties of resistors. Measurement of 'R' and measurement of specific 'R'. Conventional symbols of electrical installations.
4. Definition and properties of conductors, insulators and semi-conductors. Types of wires & cables, standard wire gauge. Classification of wires & cables-insulation and voltage grades -Low, medium and highvoltage, precautions in using various types of cables safe use of cables and wires.
5. Common electrical accessories, their specifications, Common insulating material as per B.I.S . Concept of ckts.- types of ckts, current flow. Ohm's law, series and parallel ckts. Kirchhoffs Law Reading of Analogy digital Ammeter and voltmeters, use-of protective devices of ckts-Fuses & their types,Earthing -Simple problems on ckts., -Conception of developments of domestic ckts, Alarm & switch, lamp, fans with individual switches ,Two way switches.
6. Chemicals effect of electric current-principles of electrolysis, Faraday's Law of electrolysis, Electro-chemicals equivalents. Explanation of Anodes and cathodes, Assembly of Dry cell-Electrodes Electrolytes, Grouping of dry cells for a specified voltage and current, cartridge fuse, H.R.C. type fuse.
7. Rechargeable dry cell, description Care and maintenance of cells. Grouping of cells of specified voltage and current. Lead acid cell,-description methods of charging-precautions to be taken & testing equipment. Preparation of battery charging - Testing of cells . Plug and sockets Graphical symbols used in electric technology, ckt. Elements.
8. Lead Acid cells, general defects & remedies, Nickel Alkale cell-description charging, Power & capacity of cells, Efficiency of cells, Wheat stone bridge and its application,- Charging of a lead acid, filling of electrolytes,- testing of charging, checking of discharged and fully charged battery.

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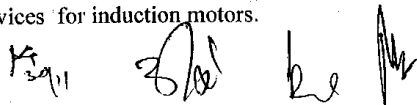
9. Magnetism & classification of magnets, Properties, care and maintenance, methods of magnetizing, magnetic material and Ferro magnetic. Tracing the magnetic field of a needle & bar magnet. Typical symbols used in electrical ckts. Simple problems on work, power, & energy.
10. Principles of Electro-magnetism, corkscrew rule, right and left hand rules. Mg. Field of current carrying conductors and loop. Earth magnetism, solenoid its property. Magnetic terms, Principle of Electro-magnetic induction, Faraday's Law, Lenz's law. Tracing the magnetic field set up by a current carrying conductor and a loop. Tracing the field of an Electro-magnet and study the variation of field strength by varying current number of turns etc. Assembly/winding of a simple Electro magnet.
11. Types of resistors used in electrical ckts. Factors controlling the 'R' of a material. Specified resistance, variation of 'R' with change of temperature.
12. Principle of generator, Fleming's right hand rules, Use of slip-ring & slit rings, Use of commutator.
13. Principle of D.C. generator-function types-parts. E.M.F. equation-self excitation and separately excited Generators-practical uses. Use of Ohm meter and Megger.
14. Types and Characters of D.C. generators – Series Generators and types
 - Shunt Generators and types, Their applications, Simple problems on generator types, capacity etc., Parts of the D.C. generators, Connection with panel Board
 Measurement of series. Shunt field resistance, Identification of terminals of D.C. Generators, Testing by megger, Heat and temperature, Thermometric scales- centigrade, Fahrenheit scale and their conversion, Names and uses of temperature measuring instruments used in workshop,
15. Fleming's left hand rule, Principle of D.C. motor Connection of shunt generators, Measurement of voltage. No load & character.-demonstration on field excitation-load character of series Gen.-connection of a compound Generator-Voltage measurement-commulative and differential-controlling and protection equipment, No load & load ch. Of a compound Gen.
16. Terms used in D.C. motor, Torque, speed, Back-e.m.f. etc., their relations, practical applications, Related problems.
17. Types characters and practical application D.C. motors, Starting of D.C. motors, -3 point & 4 point starters.

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18. Types of speed control, their advantages & disadvantages & industrial applications
19. Electrical wirings, types of wiring both domestic & industrial, Specification for wiring accessories, - wires cables, Principle of laying out in domestic wiring, testing by meggar, P.V.C concealed system, Maintenance & Repairing data sheet preparations.
20. Specification, standards for conduits & accessories. Earthing, laying diagram for industrial conduit wirings, Identification & demonstration on conduits and accessories & their uses, cutting & threading, laying earthing, use of flexible conduit & testing by meggar.
21. Comparison of D.C. & A.C., advantages of A.C. Alternating current & related terms frequency, Instantaneous value, R.M.S value Average value, Peak factor, Load factor. Generation of sine wave, phase, in phase, out phase. Obstruction of A.C. 'R' XL & XC. Impedance power factor, Average power, Reactive power, Simple problems of A.C. obstruction, etc.
22. Problems on A.C. Ckts. Both series & parallel, power consumption, P.F. etc. Concept of poly-phase star & delta connection, Line Volage & phase voltage, current power in 3 ph. Ckt.
23. Phase sequence.
24. Explanation & definition of transformer, classification of C.T. , P.T. instrument and auto/VARIAC construction, parts working E.M.F. equations, efficiencies, parallel operation & poly phase types of their connection cooling protective devices specification, simple problems on E.M.F equation, turns ratio and efficiency Special transformer. Identification of types of transformers. Connection of transformers, efficiencies of transformers, testing of transformer, parallel operation of transformer, Use of C.T. & P.T, use of Instrument transformers, Exercises on Blue print reading, tracing the wiring diagram & reproducing it in proper sequence with protective equipment sketching, the synchronizer connections, Free hand sketching of simple objects related to the trade.
25. A.C. motors, comparison with D.C. classification-pulsating field & split phasing. Working, construction of 1-ph Motors, characters, Identification of induction motors (I-ph-), squirrel cage type, Split phase type, Capacitor type, slip ring type, starting of induction motor, Reversing/ Dismantling / Assembling, Diagram of connection to a squirrel cage induction motor, connection diagram of controlling & protective devices for induction motors.

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26. Single phase motors, Split capacitors, repulsion and series motor working & principle parts, Characters, starting-running & reversing, two pole D.C dynamo or motor . Preparation of working drawings from sketches.
27. Explanation of Electrical measuring instruments, moving coil inst, Multi Meter , Wattmeter, energy meter, frequency meter and calibration of meters.
28. lights-, types of illumination & lamps, Neon, halogen, mercury vapour, sodium vapour, Fluorescent tube. placement of lights and fans and ratings.

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