Instructions:

1. Attempt any FIVE of the following:  
   (a) State different types of holders used in wiring installation.
   (b) State the types of protections provided by MCB.
   (c) State the material used for making (1) Magnetic Core (2) Fuse element
   (d) State gaseous and liquid insulating material. (one each)
   (e) State the type of insulating materials under Class Y and Class B. (any two each).
   (f) Draw circuit diagram for one lamp controlled with one switch.
   (g) Define earthing. State its types.

2. Attempt any THREE of the following:  
   (a) State any four IE Rules regarding electric safety.
   (b) Explain the suitability of aluminium as an electrical conductor with respect to
       its mechanical and electrical properties.

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(c) Select insulating materials for following parts:

(i) Insulation between heating element and base plate of electric iron.

(ii) Insulation used over copper or aluminium conductor used for making coils.

(iii) Transformer bushings.

(iv) Insulation between transmission line and pole.

(d) Compare casing caping wiring with concealed wiring. (any four points)

3. Attempt any THREE of the following:

(a) Draw and explain the use of:

(i) Combination plier

(ii) Tester

(iii) Wire Stripper

(iv) Hammer

(b) Explain MCB and ELCB with connection diagram supplying single phase load.

(c) State two applications of:

(i) PVC paper

(ii) Porcelain with type of class based on withstand temperature is insulating material.

(d) Draw wiring diagram for connection of one lamp controlled from two places. State the application of this connection.
4. Attempt any THREE of the following:

(a) State any two advantages of MCB over Fuse. State the standard specifications of MCB available in the market.

(b) Explain HRGO and CRGO. State benefits of CRGO for manufacturing of core.

(c) State the insulating materials used in motor. Write temperature class and withstand temperature ranges for them.

(d) State the procedure for laying / installation of underground cable.

(e) State the procedure for testing of earth pit resistance with necessary diagrams.

5. Attempt any TWO of the following:

(a) State Magneto-striction. Draw Hysteresis loop for:

(i) High silicon steel  
(ii) Copper

(iii) Soft iron  
(iv) Wood

(b) State failure phenomena observed in insulating material. State four reasons for failure of gaseous and solid dielectric materials.

(c) State significance of earthing. Draw and explain pipe earthing. State the values of earth resistances for:

(i) Substation  
(ii) Residential wiring

(iii) H.T. Line  
(iv) L.T. Line

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6. **Attempt any TWO of the following:**

(a) Compare the electrical, mechanical and thermal properties of:

(i) asbestos 
(ii) mica
(iii) porcelain as an insulating material

(b) Classify wiring. State the type of wiring installation used for following applications with justification:

(i) Hospital 
(ii) Spinning mill
(iii) Milk Dairy 
(iv) Hotel

(c) Give the justification with diagram – “Earthing saves human life during Electrical faults”. State adverse effect of improper earthing system.