Instructions –
(1) All Questions are Compulsory.
(2) Answer each next main Question on a new page.
(3) Illustrate your answers with neat sketches wherever necessary.
(4) Figures to the right indicate full marks.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: 10
   a) State the need for strictly following safety rules while working in electrical installations.
   b) Write any two properties of good electrical insulation material.
   c) Draw the labeled hysteresis loop for an electromagnetic material.
   d) Define dielectric failure of electrical insulating material.
   e) Name one gaseous and one liquid electrical insulation material.
   f) Draw a labeled circuit diagram of a one lamp control circuit using one switch.
   g) Define earthing related to electrical wiring system.
2. Attempt any THREE of the following:  
   a) Write any four of the IE rules to be followed in respect of safety while working in an electrical installation system.
   b) Explain the suitability of copper as an electrical conductor with reference to its mechanical and electrical properties.
   c) Explain the electrical and thermal properties of transformer oil those make it suitable as an electrical insulating medium.
   d) Explain the process and need of crimping of cable joints.

3. Attempt any THREE of the following:  
   a) Explain the use of following tools in carrying out electrical wiring installation:
      (i) Nose pliers
      (ii) Test lamps
      (iii) Crimping tools
      (iv) Cutter.
   b) Describe with reasons the failure of porcelain insulators.
   c) Explain with neat labeled circuit diagram the staircase wiring in which a lamp is controlled from two different locations.
   d) Explain the uses of safety rubber hand gloves and rubber mats in electrical engineering.
4. Attempt any THREE of the following:  
   a) Explain the use of the following components in electrical wiring system and give specification of each:  
      (i) MCB  
      (ii) ELCB  
   b) Explain with justification two uses of each of two following as an electrical conductor:  
      (i) Brass  
      (ii) Silver  
   c) Explain the phenomenon of loss of magnetism.  
   d) Describe with sketches the process of laying of underground cables by the drawing in method.

5. Attempt any TWO of the following:  
   a) State the properties of copper and aluminium which make them good conductors of electricity.  
   b) Explain the reasons for failure of gaseous and solid dielectric materials used in electrical engineering application.  
   c) Describe with neat circuit diagram the measurement procedure of earth resistance for an installation.

6. Attempt any TWO of the following:  
   a) Explain the criteria to be applied in deciding the earthing system for an electrical installation.  
   b) State two insulators of following types along with their areas of application:  
      (i) Class A  
      (ii) Class E  
      (iii) Class H  
   c) Compare the casing / capping system of electrical wiring to concealed system of electrical wiring. On the basis of look, cost, life, safety retentivity of material and suitability for locations.