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) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

1. Attempt any TEN of the following: 20
   a) Give classification of Electrical Installation with suitable examples of each.
   b) Draw symbols for lamp, exhaust fan, light socket and bell.
   c) Draw wiring diagram for 1 lamp and 1 fan.
   d) Define service connection with neat diagram.
   e) State general IE rule for deciding no. of subcircuit for light and power circuit.
   f) List out various wiring accessories for conduit wiring.
   g) State the use of busbar, MCB, ELCB and DB.
   h) Differentiate between wire and cable.
   i) Draw a neat diagram for busbar chamber.
   j) Draw a single line diagram for motor wiring circuit.
k) State the material and size of earth wire used for industrial installation.
l) List out various types of tenders.

2. Attempt any FOUR of the following: 16
   a) List out general rules and guidelines for installation of residential Electrification. (any eight)
   b) Define contract. State requirements of valid contract.
   c) A room is to be fitted with 1 fan, 1 tube and one light socket. Draw single line dia., schematic dia. and wiring diagram.
   d) Draw a neat labelled diagram for underground service connection.
   e) Compare underground and overhead service connection on the basis of safety, labour cost, location and installation time.
   f) Prepare schedule of material for overhead service connection.

3. Attempt any FOUR of the following: 16
   a) Draw symbols for
      (i) ICTP
      (ii) Ceiling fan
      (iii) Twin tubes
      (iv) Push button
   b) A room consist of following load
      Tube points 4 nos. - 40 W each
      Fan points 3 nos. - 100 W each
      Lamp points 2 nos. - 60 W each
      5A socket outlet 4 nos. - 100 W each
      15A socket outlet 2 nos. - 1000 W each
      Find
      (i) Total light load and power load.
      (ii) No. of subcircuits required.
      (iii) Rating of main switch.
      (iv) Rating of DB required.
   c) Differentiate between MCB and ELCB.
d) Compare residential installation and commercial installation on the basis of type of supply, purpose of installation, load capacity, general requirements.

e) State the design consideration for commercial installation.

f) A motor is to be operated with star delta starter. Draw wiring diagram showing connection for motor, starter and motor switch.

4. **Attempt any **FOUR** of the following:**

   a) State the need of earthing. Draw neat diagram for plate earthing.

   b) A room 4m × 5m is to be fitted with one tube, one fan and one 5A socket. Draw installation plan and wiring diagram. Calculate length of conduit and wire required.

   c) Describe how rating of main switch, motor switch DB and cable is decided in Industrial Installation.

   d) State any six requirements of valid contract.

   e) Give complete procedure for submission and opening of tender.

   f) Define security deposit and earnest money deposit.

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

   a) A three storeyed building has 10 shops on each floor. Each shop has 2 fan, 3 tubes, one power socket. Draw complete wiring diagram for above load.

   b) A hall of 10 m × 6 m is to be fitted with 8 fan and 15 tubes. Prepare schedule of material for complete installation.

   c) Prepare schedule of material for Industrial load as shown in Figure No. 1.

   ![Fig. No. 1](image-url)
6. **Attempt the following:**

   a) Decide rating of main switch, DB, motor switch and starter for following load.

      (i) 1HP, 3φ sq. cage IM, IFL = 5A
      (ii) 3HP 3φ slipring IM, IFL = 8A

   b) **Attempt any ONE of the following:**

      (i) Estimate the cost of installation for flat as shown in Figure No. 2.

      ![Fig. No. 2](image1.png)

      (ii) Estimate the cost of installation for workshop as shown in Figure No. 3.

      ![Fig. No. 3](image2.png)