

22627

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions* – (1) All Questions are *Compulsory*.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) 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) Draw the symbol for
- i) Exhaust fan
- ii) intermediate switch
- b) State any four IE rules for electrical installation.
- c) Differentiate between non-industrial and industrial load.
- d) State the purpose of guarding wire used in distribution lines.
- e) Write the aim of public lighting installation.
- f) State the purpose of estimating and costing.
- g) State the factors to be considered in selecting the type of wiring.

P.T.O.

2. Attempt any THREE of the following: 12

- a) Two lamp points, one ceiling fan and one 5A socket to be controlled by individual switches.

Draw

- i) Wiring diagram
 - ii) Schematic diagram
- b) A residential unit is having following load
- i) 4 lamps of 60W each
 - ii) 6 lamps of 40W each
 - iii) 4 ceiling fans of 60W each
 - iv) 6 sockets of 6A having 100W each
 - v) 4 sockets of 16A having 1000W each.

Calculate -

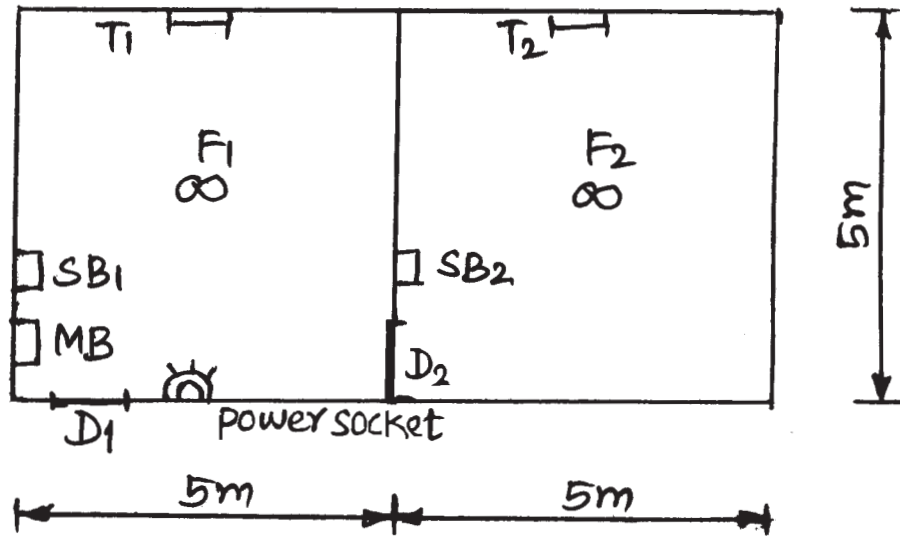
- (1) total lighting load
 - (2) total power load
 - (3) size of distribution board
 - (4) No. of subcircuit for L and F and power
- c) Compare overhead and underground service connection on any eight points.
- d) Draw wiring diagram and single line diagram of 3 phase, 415V, 5HP induction motor installation.

3. Attempt any THREE of the following: 12

- a) Explain two envelop method for tender.
- b) State the general requirements of electrical installation.
- c) Decide the rating of main switch, motor switch, distribution board and cable for a industrial installation of having 2 motors of 3 HP and 5 HP.
- d) Estimate the main material requirement for a 600m, 415/240V, 3 phase line with 4 wires in vertical configuration. The line emanate from a substation to feed a load of 30kW. Consider span between two poles as 60 meter.

4. Attempt any THREE of the following:

- a) Calculate the length of phase wire and neutral wire for the residential installation as shown in Fig. No. 1.



T₁-T₂ Tube
 F₁-F₂ Fan
 SB₁-SB₂ Switch Board
 D₁-D₂ Door
 MB Main board.

Fig. No. 1

Assume one 5A socket on each switch board. Assume height of rooms as 3m.

- b) Prepare the schedule of material for industrial installation as shown in Fig. No. 2.

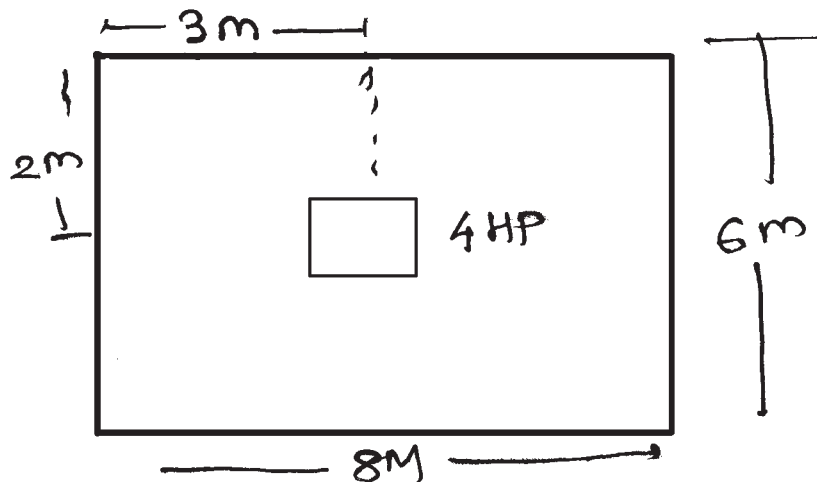


Fig. No. 2

- c) State the methods of laying underground cables and write the list of material required for laying underground cable.
- d) Draw the single line diagram of HT (11kv) substation.
- e) Explain the on-off control used for the street light installation.
- 5. Attempt any TWO of the following: 12**
- a) State the design considerations in case of industrial installation.
- b) Estimate the main material required for a 2km overhead line to extend from existing line. Assume a span of 50m.
- c) Prepare the list of materials and devices required for street lighting installation.
- 6. Attempt any TWO of the following: 12**
- a) Prepare tender notice and quotation for supply for 3 ϕ , 200kVA, 11kV/415V transformer for a polytechnic.
- b) A road 300 m long is required to be illuminated by providing 40W fluorescent lamps with 222 candle power, the width of road is 4m. Design a street lighting scheme and estimate the material required if the scheme is to be estimated for obtaining minimum level of illumination of 0.8 lux.

- c) A commercial hall of dimensions $12\text{m} \times 8\text{m}$ is to be fitted with an electric installation. Estimate the quantity of material required. Assume the height of ceiling to be 4m. The wiring is running at a height of 3m from the floor. The load in the hall is 12 fluorescent lamps of 40W each, 6 fans of 60W each and 8 no. of 5A sockets and 2 no. of ISA sockets outlets.
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