

307406

May 2019
B.Tech. IV SEMESTER
INDUSTRIAL ELECTRICAL SYSTEM
(ELPE412)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

- (i) *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
- (ii) *Answer any four questions from Part-B in detail.*
- (iii) *Different sub-parts of a question are to be attempted adjacent to each other.*
- (iv) *Assume data if missing.*

PART-A

1. (a) What are the desirable characteristics of fuse element?
(1.5) CO3
- (b) Why isolators are not opened on load? (1.5) CO2
- (c) Define single line diagram. (1.5) CO1
- (d) Name various types of lighting schemes. (1.5) CO1
- (e) What are the different ways of classifying the substations?
(1.5) CO3

- (f) Why fuse is not use in the neutral? (1.5) CO1
- (g) What are the various points which are to be earthed in accordance with Indian Electricity Rule? (1.5) CO2
- (h) What is the difference between MCC and PCC panels? (1.5) CO2
- (i) What is the effect of low power factor on the generating stations? (1.5) CO3
- (j) What is ladder logic diagram? (1.5) CO2

PART-B

2. (a) What do you understand by tariff? Describe the desirable characteristics of a tariff. Explain block rate tariff and two part tariff. (8) CO2
- (b) Explain with neat diagram the construction and working of the miniature circuit breaker (MCB). What are the disadvantages of ELCB? (7) CO2
3. (a) Define electrical wiring? Name various types of electrical wiring system. Describe general rules for wiring. (7) CO1
- (b) Figure-1 shows the plan of a small flat. The flat is to be provided with electrical connections. The positions of light and fan points and switchboards have been shown in the figure.

- (i) Decide the number of sub-circuits and show these in the installation plan.
- (ii) Calculate the size and length of wire required for the wiring installation.
- (iii) Estimate the quantity of material for underground PVC conduit wiring system. (8) CO1
4. (a) State and explain the laws of illumination. (5) CO3
- (b) A room 50 ft. × 20 ft. is illuminated by twenty 200 watt lamps. The M.S.C.P. of each lamp is 250. Assuming a depreciation factor of 1.2 and utilization factor 0.6, find the average illumination produced on the floor. (5) CO3
- (c) With a suitable diagram explain construction and working of compact fluorescent lamp (CFL). (5) CO2
5. (a) State the reason for establishing substations. Draw and explain the typical 11 kV/400 V indoor substation. Give the comparison of outdoor and indoor substations. (8) CO1
- (b) What is lightning? What are the harmful effects of lightning? Describe commonly used devices for protection against lightning surges. (7) CO2
6. (a) Describe main parts of DG set. What are the factors that need to be considered for DG set selection? List all the advantages of using a DG set compared to other types of power generation. (8) CO3

- (b) Define programmable logic controllers (PLCs). What are the main components in PLC? What are the advantages of PLCs? (7) CO2

7. Write short note on :

- (a) Uninterrupted power supply.
 (b) SCADA.

(15) CO2
 CO3

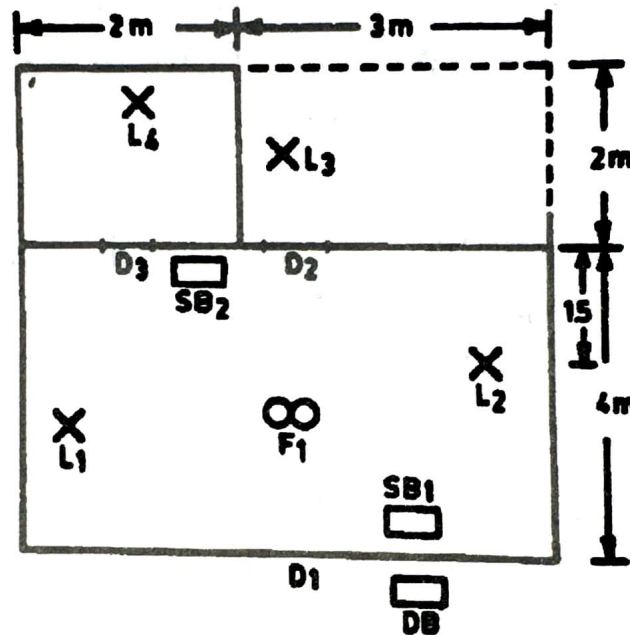


Figure-1

- D_1 - D_3 = Doors
 SB_1 - SB_2 = Switch Board
 DB = Distribution Board
 L_1 - L_4 = Lamps
 Height of roof = 3.0 m