

7. (a) Explain load calculations for wiring installation with the help of an example. CO3 (7.5)
- (b) How to select the rating of distribution board and the MCB for electrical installation? CO3 (7.5)
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Roll No. ....

Total Pages : 4

**007404**

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**B.Tech. (EL) IVth SEMESTER  
INDUSTRIAL ELECTRICAL SYSTEMS (ELPE-412)**

Time: 3 Hours]

[Max. Marks. : 75

*Instructions :*

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

**PART-A**

1. (a) What is the importance of a single line diagram (SLD) in an electrical system? CO1 (1.5)
- (b) Explain the difference between a fuse and a circuit breaker. CO1 (1.5)
- (c) Define electric shock and list *three* electrical safety practices. CO1 (1.5)
- (d) What is an inverse current characteristic in protection components? CO3 (1.5)

- (e) What factors should be considered when selecting a transformer for an industrial substation? CO3 (1.5)
- (f) Name different starting methods of three phase induction motor. CO2 (1.5)
- (g) What are the maximum permissible values of resistance of earth system for large substation, major power station, small substation and in all other cases? CO3 (1.5)
- (h) What is the function of lightning arresters? CO2 (1.5)
- (i) Define Luminous intensity and Luminous flux in illumination systems. CO1 (1.5)
- (j) Differentiate PCC and MCC panels. CO2 (1.5)

### PART-B

- 2. (a) Explain the selection criteria for cables and wires used in LT system wiring. How are they sized and specified? CO3 (7.5)
- (b) What is ELCB? Define function of ELCB in electrical installation. Explain the construction and working of different types of ELCB. CO2 (7.5)
- 3. (a) Discuss the different types of illumination schemes used in residential and commercial premises. What are the factors that influence the selection of luminaries? CO1 (7.5)

- (b) Describe the construction and working of Compact Fluorescent Lamps. Compare CFL with incandescent lamp. CO2 (7.5)
- 4. (a) Discuss the importance of a DG system in an industrial electrical system. Explain sizing of DG systems with the help of an example. CO3 (7.5)
- (b) What is UPS? Write down the various roles/functions of UPS in electrical systems. Draw and explain On-line UPS system with suitable diagram. CO1 (7.5)
- 5. (a) Prepare the single line diagram of a pole mounted substation indicating the various protective devices installed on the HT and LT sides. State the function of each device. CO1 (7.5)
- (b) Discuss the importance of power factor correction in industrial electrical systems. Explain the different methods used for power factor correction. CO2 (7.5)
- 6. (a) Discuss the role of PLC in automation and its advantages over traditional control systems. Explain the components of a PLC based control system. CO2 (7.5)
- (b) Discuss the role of SCADA system in power system operation. CO2 (7.5)