

(3 Hours)

[Total Marks: 80]

**NOTE**

1. Question No 1 is Compulsory.
2. Solve any three out of the remaining.
3. Figure to the right side indicates marks.
4. Assume the suitable data and mention the same if required

**QNo 1 Answer the following questions**

- a. Discuss the design features of interconnection drawing with figure [5]
- b. Discuss with examples how to maximise the efficiency of a system for minimising the energy consumption. [5]
- c. Discuss how the soft starter is energy efficient device? If so, then what is the energy saving potential? [5]
- d. How electricity bill will help to implement the monitoring and targeting? [5]

QNo 2a Discuss the design features of different types of distribution systems with figure. [10]

QNo 2b The following loads are connected to a distribution transformer. Calculate (i) KVA rating of transformer (ii) State and justify the various assumption related to the selection of transformer and other ratings (iii) Draw a single line diagram showing various metering instruments, protections and load connections [10]

| Sr No | Load | Rating KW | Efficiency | Power Factor | Load Factor | Diversity Factor |
|-------|------|-----------|------------|--------------|-------------|------------------|
| 1     | L1   | 200       | 0.85       | 0.8          | 0.83        | 0.7              |
| 2     | L2   | 400       | 0.8        | 0.75         | 0.72        | 0.7              |
| 3     | L3   | 500       | 0.8        | 0.8          | 0.63        | 0.5              |
| 4     | L4   | 100       | 0.65       | 0.8          | 0.85        | 0.5              |

QNo 3a Discuss the various energy analysis techniques used for energy optimisation [10]

QNo 3b Discuss how to implement the building management system as an energy efficient system design tool. [10]

QNo 4a Discuss in detail procedure involved and assumptions in the design of illumination system for a reading room with a given dimensions. [10]

QNo 4b Discuss in detail procedure involved in the selection of cable conductor size and other specifications, for a cable used for connection of a motor to a control panel through a short length. [10]

QNo 5a Discuss the various features of Energy Conservation Building Code 2007. [10]

QNo 5b Discuss how the energy is managed in transformer and distribution network of an electrical system [10]

QNo 6a Discuss the steps and procedure adopted for energy performance assessment of motors. [10]

QNo 6b Discuss the design features of Busbar and Switch board [10]