

Roll No																			
---------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
MID TERM EXAMINATION - NOV 2023**

**Semester :** Semester V - 2021

**Course Code :** EEE2020

**Course Name :** Sem V - EEE2020 - Electrical Distribution Systems

**Program :** B. TECH

**Date :** 6-NOV-2023

**Time :** 9:30AM - 11:00AM

**Max Marks :** 50

**Weightage :** 25%

---

**Instructions:**

- (i) Read all questions carefully and answer accordingly.*
  - (ii) Question paper consists of 3 parts.*
  - (iii) Scientific and non-programmable calculator are permitted.*
  - (iv) Do not write any information on the question paper other than Roll Number.*
- 

**PART A**

**ANSWER ALL THE QUESTIONS**

**(5 X 2 = 10M)**

1. Define the term Load and mention the different types of load modeling. (CO1) [Knowledge]
2. Define the term Load forecasting and its importance. (CO1) [Knowledge]
3. What are the different types of supply systems that are adopted for transmission of electric power? (CO1) [Knowledge]
4. Define the term grounding and list the importance of grounding. (CO2) [Knowledge]
5. List out the comparison between AIS and GIS. (CO2) [Knowledge]

## PART B

### ANSWER ALL THE QUESTIONS

(2 X 10 = 20M)

6. As residential and commercial areas expand due to population growth and new areas being developed, it becomes essential to consider the increased power demand and the diversity between various types of loads. This helps optimize the additional capacity required. To achieve this, variations in peak loads for different types of equipment are analyzed. Actual connected loads are detailed in a table, and it's evident that certain loads, such as lighting, fans, domestic appliances, and home heating and cooling, exhibit significant fluctuations throughout the day. To ensure an efficient power supply system, it's crucial to account for diversified maximum demands based on customers and their connected loads when selecting the appropriate transformer rating. As electrical engineers, let's briefly discuss the processes involved in choosing transformers to meet the power demands of 500 residential flats connected to a feeder line. Each distribution transformer serves 10 flats, operating at 11 kV/415 V in a 3-phase system, and this choice is informed by a load survey that identifies maximum diversified demands per customer.

Load in kW	Appliance	Coincidence Factor
1.5 kW/ flat	Washing machine & drier	0.8
0.2 kW/ flat	Refrigerator	0.65
0.9 kW/ flat	Lighting & Fans	0.9
0.5 kW/ flat	Electronic gadgets	0.7
0.6 kW/ flat	Other appliances & loads	0.5

(CO1) [Comprehension]

7. As the residential or commercial areas expand as a result of an increase in population and the addition of new areas, it will be necessary to account for the new loads that are being added. Additionally, it will be necessary to take into account the diversity among similar loads and the non-coincidence between the peaks of different types of loads that are being added. This will maximize the effectiveness of the additional capacity that is going to be provided. The aim is served by taking into account the variance in the peaks of the various types of loads. Actual connected loads consist of: (i) lighting and fans, (ii) a refrigerator, (iii) central air conditioning and heating, (iv) domestic appliances like mixers, wet grinders, and the like, (v) televisions, music systems, and other electronic devices, and (vi) other appliances like electric washing machines, dryers, and the like. It is vital to estimate the various load patterns connected to the system in order to determine how the load window can support the identification of the load pattern because the load varies in different ways and has distinct characteristics. Provide a summary of the main methods of load modelling along with the associated mathematical equations

(CO1) [Comprehension]

## PART C

### ANSWER THE FOLLOWING QUESTION

(1 X 20 = 20M)

8. A bus bar in electrical engineering serves as a conductor or a set of conductors responsible for gathering electric power from incoming feeders and distributing it to outgoing feeders. This Busbar-System comprises an Isolator and a Circuit Breaker. When a fault occurs, the circuit breaker is activated, disconnecting the faulty portion of the bus bar from the circuit. Mr. Thanish is undertaking a project to commission a new 66/33KV/11KV substation in Bengaluru. In your role as an electrical engineer, assist him in creating a basic layout for the substation. The system has two 66 kV incoming lines, two 33 kV and along with four 11 kV outgoing lines. All substation equipment, such as transformers, generators, and feeders, is linked exclusively to this bus bar. Additionally, depict the auxiliary power supply setup for the substation.

(CO2) [Application]