Code: 7G273

IV B.Tech. I Semester Supplementary Examinations March/April 2023
Distribution of Electrical Power
(Electrical and Electronics Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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|		Marks	CO	BL

UNIT–I

		Marks	CO	BL
1. a)	Explain briefly classification of loads? How is load modeling done in distribution networks?	5M	1	2
b)	The annual peak load on a 30mw power station is 25 mw. The power station supplies loads having maximum demands of 10mw, 8.5mw, 5mw and 4.5mw. The annual load factor is 45%. Find i) Average load ii) Energy supplied per year iii) Demand factor iv) Diversity factor	9M	1	5

OR

		Marks	CO	BL
2. a)	Explain the single line diagram of radial type primary feeder and mention the factors that influence the selection of primary feeder	7M	1	2
b)	Explain basic design practice of secondary distribution system and also discuss about secondary banking.	7M	1	2

UNIT–II

		Marks	CO	BL
3. a)	Discuss the requirements and design features of distribution systems	6M	2	2
b)	Consider the singe phase radial distributor shown in the figure below. The magnitude of load currents, p.fs and distances are indicated in the figure. The resistance and reactance of each wire are 0.1 per km and 0.2 per km respectively. It is required to maintain voltage at point B as $230\angle0^0$ volts. Find voltage drop in the three sections and total voltage drop in the feeder. The p.f. angles of individual loads are w.r.t. voltage at point B.			

		Marks	CO	BL
		8M	2	5

OR
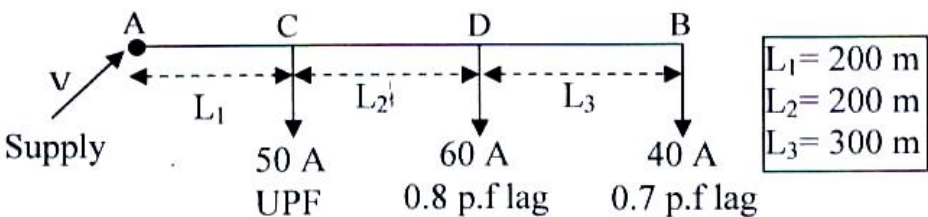
		Marks	CO	BL
4. a)	Write the comparison between DC and AC distribution systems	4M	5	2

b) A single phase distributor 2 km long supplies a load of 120A at 0.8 p.f. lagging at its far end and a load of 80A at 0.9 p.f lagging at its mid point. Both power factors are referred to the voltage at the far end. The resistance and reactance per km are 0.05 and 0.1 respectively. If the voltage at the far end is maintained at 230v, Find i)voltage at the sending end ii)phase angle between voltages at the two ends | 10M | 2 | 5

UNIT–III

5. a) Explain the classification of substations according to design | 7M | 3 | 2

b) Compare the four and six feeder patterns of substation service area if they are thermally loaded | 7M | 3 | 2

OR

6. a) Mention the various factors that are to be considered in selecting the ideal substations | 7M | 3 | 2

b) Explain the Double bus-Single breaker scheme. | 7M | 3 | 2

UNIT–IV

7. a) Derive the equation for load power factor for which the voltage drop is maximum | 7M | 4 | 2

b) A 3 Phase, 500 H.P, 50 Hz, 11 kV star connected induction motor has a full load efficiency of 85% at a lagging p.f. of 0.75 and connected to a feeder. If it is desired to correct it to a p.f. of 0.9 lagging load. Determine the following: (i) The size of the capacitor bank. (ii) The capacitance of each unit if the capacitors are connected in star as well as delta | 7M | 4 | 5

OR

8. a) Explain the effect of shunt compensation on distribution system. | 7M | 4 | 2

b) A single-phase motor connected to a 240V, 50 Hz supply takes 20 A at p.f. of 0.75 lag. A capacitor is shunted across the motor terminals to improve the p.f to 0.9 lag. Determine the capacitance of the capacitor to be used. | 7M | 4 | 5

UNIT–V

9. a) Draw a block diagram and explain for a typical distribution system planning process | 7M | 5 | 2

b) Explain the various factors affecting the distribution system planning? | 7M | 5 | 2

OR

10. a) Explain the importance of Load forecasting? | 6M | 5 | 2

b) Draw and explain the flow chart for the distribution system planning process? | 8M | 5 | 2

END