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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR  
(AUTONOMOUS)

B.Tech IV Year I Semester Supplementary Examinations August-2021

ELECTRICAL DISTRIBUTION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 a Draw and explain a schematic single line diagram of electrical distribution system. 6M  
b What is Load curve? What is the importance of load curve? 6M

OR

- 2 a A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find (i) the reserve capacity of the plant (ii) the daily energy produced and (iii) maximum energy that could be produced daily if the plant while running as per schedule, were fully loaded. 6M  
b Define and explain the terms feeder, distributor & service mains with diagram. 6M

**UNIT-II**

- 3 a Derive the equations for voltage drops in each section and minimum potential in radial Feeder with uniformly distributed load fed at unequal voltages at both ends. 8M  
b Draw the neat sketch of ring main distributed system? What are the advantages of ring main distributed system? 4M

OR

- 4 a A single phase distributor 2 kilometers long supplies a load of 120 A at 0.8 p.f. lagging at its far end and a load of 80 A 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 (go and return) are 0.05  $\Omega$  and 0.1  $\Omega$  respectively. If the voltage at the far end is maintained at 230 V, calculate: (i) Voltage at the sending end (ii) Phase angle between voltages at the two ends. 7M  
b What are the advantages of AC distribution? 5M

**UNIT-III**

- 5 a Explain Indoor and outdoor substation. 6M  
b Explain different types of bus bar arrangements with neat sketch? 6M

OR

- 6 a Explain the Grounded and ungrounded system? 5M  
b What is resistance grounding? What are its advantages and disadvantages? 7M

**UNIT-IV**

- 7 a How we can improve the power factor and explain different types of Power Factor Improvement Equipment. 6M  
b Explain the role of shunt and series capacitors in power factor correction. 6M

OR

- 8 a A single phase a.c. generator supplies the following loads : (i) Lighting load of 20 kW at unity power factor, (ii) Induction motor load of 100 kW at p.f. 0.707 lagging, (iii) Synchronous motor load of 50 kW at p.f. 0.9 leading. Calculate the total kW and kVA delivered by the generator and the power factor at which it works. 6M  
b How do you justify economically the connection of capacitors for the improvement of p.f? 6M

**UNIT-V**

- 9 a Define distribution automation? What are the various functions of distribution automation? **6M**  
b Explain the various sensors used in distribution automation? **6M**
- OR**
- 10 a Explain about Supervisory Control And Data Acquisition? **6M**  
b What is geographical information system and explain in brief? **6M**

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