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QUESTION BANK (DESCRIPTIVE)

Subject with Code : Electrical Distribution Systems(19EE0223) **Course & Branch**: B.Tech - EEE
Year &Sem: IV-B.Tech& I-Sem **Regulation:** R19

UNIT -I
INTRODUCTION TO DISTRIBUTION SYSTEMS

1. Discuss the relationship between load factor and loss factor? [L4,CO1,12M]
2. Draw a schematic single line diagram of an electrical distribution system and Explain its typical parts in detail. [L4,CO1,12M]
3. A generating station has the following daily load cycle :

Time (Hours)	0—6	6—10	10—12	12—16	16—20	20—24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find (i) maximum demand (ii) units generated per day (iii) average load and (iv) load factor. [L3,CO1,12M]
4. Discuss different types of loads present in distribution system and explain their characteristics? [L4,CO1,12M]
5. a) What is Load curve ? what is the importance of load curve? [L1,CO1,6M]
   b)Explain the AC secondary distribution system with diagram. [L1,CO1,6M]
6. A generating station has a maximum demand of 20MW, 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. [L4,CO1,12M]
7. a)Define and explain the terms feeder, distributor &service mains with diagram.[L1,CO1,6M]
   b) Discuss about Diversity factor and Coincidence factor. [L3,CO1,6M]
8. Explain connection schemes of distribution system and give the advantages disadvantages. [L1,CO1,12M]
9. a) Compare Overhead and Underground distribution systems? [L2,CO1,6M]
   b) A distribution substation experiences an annual peak load of 3,500 kW. Thetotal annual energy supplied to the primary feeder circuits is 107 kWh. Find
      i. the annual average power
      ii. the annual load factor[L3,CO1,6M]
10. Explain the various factors affecting the distribution system planning. [L1,CO1,12M]

UNIT -II
AC AND DC DISTRIBUTION SYSTEMS

1. A single phase distributor one km long has resistance and reactance per conductor of 0·1 Ω and 0·15 Ω respectively. At the far end, the voltage VB = 200 V and the current is 100 A at a p.f. of 0·8 lagging. At the mid-point M of the distributor, a current of 100 A is tapped at a p.fof 0·6 lagging with reference to the voltage VM at the mid-point. Calculate : (i) voltage at mid-point (ii) sending end voltage VA (iii) phase angle between VA and VB. [L3,CO2,12M]
2. Derive the expression for power factor referred to receiving end Voltage in A.C. distributor with vector diagram. [L3,CO2,12M]
3. Derive an expression for the voltage drop and power loss for a uniformly loaded distributor fed at one end. [L3,CO2,12M]
4. A 2 wire DC distributor cable AB is 2 KM long supplies loads of 100A,150A,200A and 50A situated 500m,1000m,1600m and 2000m from the feeding point A. Each conductor has a resistance of 0.01ohm per 1000m.calculate potential difference at each load point if a potential difference of 300V is maintained at point A. [L4,CO2,12M]
5. Derive the expression for Power factors referred to respective load voltages in A.C. distributor with vector diagram. [L3,CO2,12M]
6. A two-wire DC distributor AB, 600 meters long is loaded as under:

   Distance from A (meters): 150 300 350 450

   Loads in Amperes : 100 200 250 300

   The feeding point A is maintained at 440V and that of B at 430V. If each conductor has a Resistance of 0.01Ω per 100 meter, calculate (i) The current supplied from A to B (ii). The power dissipated in the distributor. [L4,CO2,12M]
7. 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 Ω and 0•1 Ω 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. [L4,CO2,12M]
8. 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 bothends. [L3,CO2,6M]

   (b)What are Disadvantages of AC distribution System. [L3,CO2,4M]
9. A 2-wire d.c. distributor ABCDEA in the form of a ring main is fed at point A at 220 V and is loaded as under :10A at B ; 20A at C ; 30A at D and 10 A at E.The resistances of various sections (go and return) are : AB = 0·1 Ω ; BC = 0·05 Ω ; CD = 0·01Ω ; DE = 0·025 Ω and EA = 0·075 Ω. Determine :(i) the point of minimum potential

   (ii) current in each section of distributor. [L4,CO2,12M]
10. a) Discuss importance of voltage drop and power loss calculations in distribution. [L3,CO2,6M]

    b) Explain with neat sketches radial type and loop type primary feeders [L2,CO2,6M]

UNIT -III
SUBSTATIONS

1. a) Explain the various factors to be considered to decide the ideal location of substation? [L1,CO3,6M]
   b) Explain how to decide the rating of a distribution a substation? [L1,CO3,6M]
2. a)What is Neutral grounding? What are the advantages of neutral grounding. [L1,CO3,6M]
   b) What are the disadvantages of ungrounded system? [L1,CO3,6M]
3. Draw the layout and schematic connection Pole-Mounted Sub-Station? Give the advantages and disadvantages . [L3,CO3,12M]
4. Explain the classification of Substations? [L1,CO3,12M]
5. What are The equipments required for a transformer sub-station. Explain them? L2,CO3,12M]
6. Draw the layout and schematic connection Underground Sub-Station?Give the advantages and Disadvantages. [L3,CO3,12M]
7. Explain different types of bus bar arrangements with neat sketch? And give the advantages Disadvantages. [L1,CO3,12M]
8. a)Explain the Grounded and ungrounded system? [L1,CO3,6M]
   b)Explain Indoor and outdoor substation. [L1,CO3,6M]
9. a) What is solid grounding? What are its advantages and disadvantages solid grounding. [L1,CO1,6M]
   b)What is resistance grounding? What are its advantages and disadvantages? [L1,CO3,6M]
10. Explain how do you analyze a substation service area with ‘n’ primary feeders? [L1,CO3,6M]

UNIT -IV

POWER FACTOR CORRECTION

1. a) Define power factor ? explain voltage and current relationship for different loads. [L1,CO3,6M]
   b)Explain Phase advancers. [L1,CO4,6M]
2. 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. [L4,CO1,12M]
3. Explain the role of shunt and series capacitors in power factor correction. [L1,CO4,12M]
4. How we can improve the power factor and explain different types of Power Factor Improvement Equipment. [L3,CO4,12M]
5. Explain Most economical power factor for constant KW load & constant KVA type loads? [L4,CO4,12M]
6. a) Write notes on how an over excited synchronous machine improves power factor? [L1,CO1,6M]
   b) An alternator is supplying a load of 300 kW at a p.f. of 0·6 lagging. If the power factor is raised to unity, how many more kilowatts can alternator supply for the same KVA loading ? [L4,CO4,6M]
7. a) Explain the effect of shunt compensation on distribution system? [L1,CO4,6M]
   b) How do you justify economically the connection of capacitors for the improvement of P.F ? [L4,CO4,6M]
8. a) Determine the optimum capacitor allocation for improvement of power factor. [L1,CO4,6M]
   b) List the various causes of low power factor and explain. [L1,CO4,12M]
9. a) What are the disadvantages of low power factor. [L1,CO4,6M]
   b) Explain Static capacitors in power factor improvement. [L1,CO4,6M]
10. a) Why is unity power factor not the most economical P.F? [L1,CO4,6M]
    b) Why a consumer having low power factor is charged at higher rates ? [L1,CO4,6M]

UNIT -V
DISTRIBUTION AUTOMATION

1. Explain distribution automation? Give the various functions of distribution automation. [L1,CO5,12M]
2. a) What are the fundamental requirements of communication infrastructure? [L2,CO5,6M]
   b) whatare the communication methods? [L1,CO5,6M]
3. Explain the distribution system Project planning with diagram. [L3,CO5,12M]
4. a) What are the benefits of distribution automation. [L1,CO5,6M]
   b) Explain about Information technology and LAN. [L1,CO5,6M]
5. Explain about Supervisory Control and Data Acquisition? [L1,CO6,12M]
6. Discuss briefly about Consumer Information Service? [L3,CO6,12M]
7. What is geographical information system and explain in brief? [L1,CO6,12M]
8. Explain about Automatic Meter reading in distribution automation? [L1,CO6,12M]
9. Explain the various sensors used in distribution automation? [L1,CO6,12M]
10. a) What is communication ?Give Methods of Communication. [L1,CO6,6M]
    b) Explain about Sensors. [L1,CO6,6M]