

Code No. M0228**R07****Set No.1****IV B.Tech I Semester Supplementary Examinations, February, 2012****ELECTRICAL DISTRIBUTION SYSTEMS****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Draw a schematic single line diagram of an electrical distribution system and explain its typical parts in detail.
b) Write in detail about commercial and agricultural loads and their respective characteristics.
2. a) Give the various loading and voltage level factors that influence the design and operation of primary feeders?
b) Discuss the advantages and disadvantages of radial and loop type primary feeders.
3. a) What are the various factors that are to be considered in selecting a substation location?
b) Compare the four and six feeder's pattern of substations.
4. Derive the equations for voltage drop and power loss in a radial feeder with uniformly distributed load.
5. a) What are the objectives of distribution system protection and explain fuse-to-fuse coordination.
b). The per unit values of positive, negative and zero sequence reactances of a network at fault are 0.08, 0.07 and 0.05 respectively. Determine the fault current if the fault is double line to ground.
6. a) What is the need for coordination of different protective devices? Explain in detail.
b) Discuss the overall coordination procedure employed for the protection of distribution systems.

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7. a) Compare and explain the role of shunt and series capacitors in P. F correction?
b) A 400V, 50 cycles three phase line delivers 207KW at 0.8p.f. (lag). It is desired to bring the line p.f. to unity by installing shunt capacitors. Calculate the capacitance if they are i) star connected
ii) delta connected.
8. a) Write the various ways to improve the distribution system overall voltage regulation?
b) Describe the operation of AVR with a neat diagram.

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Set No.2

IV B.Tech I Semester Supplementary Examinations, February, 2012

ELECTRICAL DISTRIBUTION SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. a) Discuss the classification of loads and their characteristics.
b) Define and derive the relationship between load and loss factors.
2. a) What are the various factors that influence the primary feeder loading and voltage levels?
b) Explain the various types of radial primary feeders in detail with suitable sketches?
3. Give a detailed analysis of square shaped and hexagonal shaped distribution substation areas.
4. Discuss the various faults that occur and their probability in a distribution system and give the procedure for fault current calculation in 3 phase faults.
5. a) Discuss the objectives of distribution protection.
b) Explain the principle of operation and the characteristics of circuit reclosers and line sectionalizers.
6. a) Explain in detail how the co-ordination of various protective devices helps in improving system performance.
b) Discuss clearly the coordination procedure between a circuit breaker and a fuse.

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Set No.2

7. a) With the help of a phasor diagram, show how a series capacitor boosts the voltage? What are the drawbacks of this method?
- b) A synchronous motor having a power consumption of 50KW is connected in parallel with a load of 200KW at lagging p.f of 0.8. If the combined load has a power factor of 0.9, what is the value of leading reactive KVA supplied by the motor and at what p.f is it working?
8. a) Briefly explain the line drop compensation on voltage control.
- b) Write the various ways to improve the distribution system overall voltage regulation?

FirstRanker

Code No. M0228**R07****Set No.3****IV B.Tech I Semester Supplementary Examinations, February, 2012****ELECTRICAL DISTRIBUTION SYSTEMS****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain the following:
 - i) Coincidence factor
 - ii) Contribution factor
 - iii) Loss factor
 - iv) Maximum Demand
- b) Write in detail about residential and industrial loads and their respective characteristics.
2. a) List the various design and operational aspects affecting the primary feeder loading and voltage levels.
- b) Draw the single line diagram of radial type feeders and mention the factors that influence the selection of primary feeders.
3. a) List out the benefits with the optimal location of substations.
- b) How do you analyze a substation service area with N primary feeders?
4. Briefly discuss the various faults that occur in a distribution system and their protective schemes employed.
5. a) Explain the objectives of distribution system protection.
- b) Explain the characteristic features of fuses and circuit breakers.
6. a) Discuss the importance of the coordination of different protective devices.
- b) Explain the fuse to fuse coordination procedure.

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7. a) Justify the importance of power factor correction.
- b) A 3-phase, 50Hz, 2200V induction motor develops 400H.P at a power factor 0.8 lag and efficiency 90%. The power factor is to be raised to unity by connecting a bank of condensers in delta across the supply mains. If each of the capacitance unit is built up of 4 similar 550V condensers, calculate the required capacitance of each condenser and its KVA rating.
8. a) How an AVB can control voltage? With the aid of a suitable diagram explain its function.
- b) With the help of a phasor diagram, show how a series capacitor boosts the voltage? What are the drawbacks of this method?

Code No. M0228**R07****Set No.4****IV B.Tech I Semester Supplementary Examinations, February, 2012****ELECTRICAL DISTRIBUTION SYSTEMS****(Electrical and Electronics Engineering)****Time: 3 hours****Max. Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. a) Explain load modeling and its characteristics.
b) Write in detail about commercial and agricultural loads and their respective characteristics.
2. a) Explain the various types of radial primary feeders in detail with suitable diagrams?
b) Give the various loading and voltage level factors that influence the design and operation of primary feeders?
3. a) List out the rules to be observed to select an ideal location for a substation and derive the expression for the rating of a distribution substation.
b) Compare the four and six feeder pattern for substations with the corresponding expressions.
4. Derive the necessary equations for voltage drop and power loss in a radial feeder with non-uniformly distributed load.
5. a) Discuss the objectives of distribution system protection.
b) Discuss the merits and demerits of circuit breakers over fuses.
6. a) Explain in detail the general coordination procedure for over current protective devices.
b) Discuss the coordination procedure between a fuse and an auto-recloser.

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7. a) Explain the economic justification of installing a capacitor in a distribution system.
- b) A feeder supplies an Industrial consumer with a cumulative load of (i) Induction Motors totaling 200HP which runs at an average efficiency of 89% and a lagging average p.f. of 0.85. (ii) Synchronous motors totaling 100HP with an average efficiency of 85% and (iii) a heating load of 100KW. The Industrial consumer plans to use the synchronous motors to correct its overall power factor. Determine the required p.f. of the synchronous motors to correct the overall p.f. at peak load to (i) unity (ii) 0.95 lag.
8. a) Why do we need to control the voltage of a power system? Explain in detail.
- b) What is a line drop compensator? How is it used for the voltage regulation in a distribution system?