Code No: 07A70208 **R07** **Set No. 2**

IV B.Tech I Semester Examinations,NOVEMBER 2010
ELECTRICAL DISTRIBUTION SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Briefly explain the line drop compensation on voltage control.
   (b) Voltage control and p.f. correction are necessary in power systems? Explain. What are the disadvantages of low voltage and low p.f. of the system? [6+10]
2. (a) A 50MW hydro generator delivers 320 million kWh during the year. Calculate the plant load factor.
   (b) Explain the load characteristics of distribution system. [6+10]
3. (a) Explain the salient points in general co-ordination procedure.
   (b) Explain Fuse-Fuse coordination. [8+8]
4. What are the various factors considered while selecting a over current protective device. Explain the operation of circuit recloser and circuit breaker. [16]
5. (a) Discuss the basic features of applicapability of compensation through shunt and series capacitors in radial distribution systems.
   (b) Compare and explain the role of shunt and series capacitors in power factor correction. [8+8]
6. (a) Classify different types of primary feeders and give their merits and demerits.
   (b) Explain basic design practice of secondary distribution system and also discuss about secondary banking. [6+10]
7. Derive the equation for 'k' constant in voltage drop calculations of substation supplied with 'n' primary feeders. [16]
8. (a) Draw and explain typical four - wire multi - grounded common neutral distribution system.
   (b) Derive the condition of load factor for which the voltage drop is maximum. [10+6]

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Code No: 07A70208 **R07** **Set No. 4**

IV B.Tech I Semester Examinations,NOVEMBER 2010
ELECTRICAL DISTRIBUTION SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Compare and explain role of shunt and series capacitors in power factor correction.
   (b) A 400V, 50cycles 3-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. [10+6]
2. Derive the total area served by four feeders is 0.667 times the total area served by six feeders if they are thermally loaded. [16]
3. Discuss different types of loads present in distribution system and explain their characteristics. [16]
4. What are the common types of faults in a single phase 2-wire and 3-wire systems. Explain how fault current is computed with proper single line diagrams. [16]
5. (a) Explain Control and rating of voltage regulators.
   (b) Explain the line drop compensation on voltage control. [8+8]
6. Derive the expression for voltage drop and power loss for 3 phase balanced system and non-three phase system. Compare both of them. [16]
7. Explain general coordination procedure? Explain different types of coordination of protective devices. [16]
8. Assume that a star connected three phase load is made up of three impedances of $50\angle 25^0$ ohms each and that the load is supplied by a three phase four wire primary express feeder. The balanced line to neutral voltages at the receiving end are $v_{an} = 7630\angle 0^0$V, $\bar{v}_{bn} = 7630\angle 240^0$V, $\bar{v}_{cn} = 7630\angle 120^0$ V. Determine the following:
   (a) The phase currents in each line
   (b) The line to line phasor voltages
   (c) The total active and reactive power supplied to the load. [16]

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Code No: 07A70208 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,NOVEMBER 2010
ELECTRICAL DISTRIBUTION SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the different types of manual methods used for the solution of radial networks and explain in detail.
   (b) Derive the equation for load p.f. for which the voltage drop is maximum. [10+6]

2. (a) Briefly explain the line drop compensation on voltage control.
   (b) Voltage control and p.f. correction are necessary in power systems? Explain. What are the disadvantages of low voltage and low p.f. of the system? [6+10]

3. Discuss about different load modeling and their characteristics. [16]

4. What is meant by primary feeder loading? Give some of the factors which will affect the design loading of a feeder. [16]

5. A single phase 3 wire distribution line 600 V - 0 - 160 V, feeds a load of 10 KVA line to line and 3 KVA on each line to ground. The transformer is 7620V/240V 25kva with 5% impedance. The line impedance is j0.15 ohm per wire. Calculate the fault current and fault MVA for:
   (a) L-L fault 1km from the transformer
   (b) L-G fault 1km from the transformer. [8+8]

6. A 3-phase transformer rated 7000KVA and has a over load capability of 125% of the rating. If the connected load is 11150KVA with a 0.8 pf (lag), determine the following :
   (a) The KVAR rating of shunt capacitor bank required to decrease the KVA load of the transformer to its capability level,
   (b) the p.f. of the corrected level,
   (c) the KVAR rating of the shunt capacitor bank required to correct the load p.f. to unity. [6+4+6]

7. (a) Explain general coordination procedure.
   (b) Explain Fuse- Circuit breaker coordination. [8+8]

8. (a) A 3 - Φ, 4.16kV wye grounded feeder main has 4 copper conductors with an equivalent spacing of 1.0 m between phase conductors and a lagging load power factor of 0.9. Determine the 'k' constant of the main feeder. Let r =

1.503Ω/m and x=0.7456 Ω/m. Also calculate the percent voltage drop in the main if a lumped sum load of 500 kVA with a lagging p.f. of 0.9 is connected at the end of 1m long feeder main.

(b) List out the benefits obtained from optimal location of substations. [8+8]

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Code No: 07A70208 **R07** **Set No. 3**

IV B.Tech I Semester Examinations,NOVEMBER 2010
ELECTRICAL DISTRIBUTION SYSTEMS
Electrical And Electronics Engineering

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) In terms of line parameters, derive the equation for load p.f. for which voltage drop is minimum.
   (b) An unbalanced 3 - phase delta connected load is connected to a balanced 3 - phase, 3 - wire source. The load impedances $Z_A = 60\angle 30^0\Omega$/ph, $Z_B = 80\angle -45^0\Omega$/ph and $Z_C = 50\angle 35^0\Omega$/ ph respectively. The line voltage of A phase is 12.6 kV. Use the A phase to phase voltage as reference and determine the line currents and total real and reactive powers. [6+10]

2. (a) Give the classification of loads and draw their characteristics.
   (b) A load of 100 kW is connected at the riverside substation. The 15 min. weekly maximum demand is given by 75 kW and the weekly energy consumption is 4200kWh. Find the demand factor, the 15 min. weekly load factor of the substation and its associate loss factor. [8+8]

3. (a) Discuss the procedure for fault current calculation in following faults:
      i. 3-phase fault.
      ii. Single Line-Ground fault
   (b) Explain about the operation of a circuit breaker. [10+6]

4. (a) Classify the types of primary feeders and give the applications of each type primary feeder.
   (b) Draw and explain one line diagram of secondary distribution system and explain the parts of it. [8+8]

5. (a) Explain:
      i. What is coordination?
      ii. What is a protective device?
   (b) Explain general coordination procedure. [8+8]

6. Compare the four and six feeder patterns of substation service area if they are thermally loaded. [16]

7. (a) How is economical p.f arrived at for a given distribution system with different loads.
   (b) Explain shunt capacitors compensation. [8+8]

8. (a) Explain the use of induction regulator and voltage control.

(b) Discuss the effect of series capacitors on voltage control. [8+8]

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