Code No: R05410210 **Set No. 1**

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronic Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Why loads are classified in distribution systems and how they are classified? Also explain their different characteristics. [2+4+10]

2. (a) Assume that the service area pf a given feeder is increasing as a result of new residential developments. Determine the new load and area that can be served with the same percent voltage drop if the new feeder voltage level is increased to 34.5 kV from the previous voltage level of 12.47kV.
   (b) Discuss in detail the factors which influence the selection of primary feeder rating. [8+8]

3. (a) Explain the various factors to be considered to decide the ideal location of substation.
   (b) Explain how to decide the rating of a distribution substation. [9+7]

4. (a) Prove the power loss due to load currents in the conductors of the 2-phase, 3 wire lateral with multi-grounded neutral is approximately 1.64 times larger than the one in the equivalent 3-phase lateral.
   (b) Consider the three phase, 3 wire 240V secondary system with balanced loads at A, B and C as shown in figure 4b Determine:

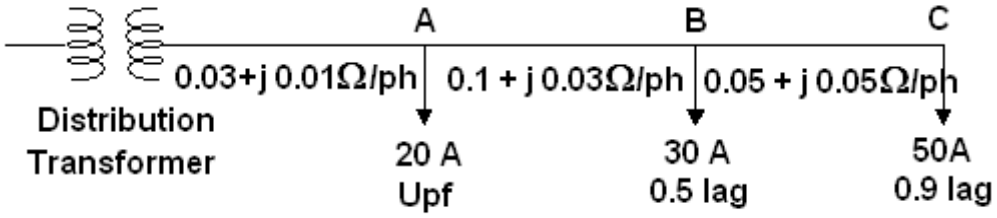

Figure 4b

   i. The voltage drop in one phase of lateral
   ii. The real power per phase for each load
   iii. The reactive power per phase for each load. [8+8]

5. (a) What are the objectives of Distribution system protection.
   (b) Explain about the operation of a Fuse. [10+6]

6. (a) Explain Fuse-Fuse coordination.
   (b) Explain Fuse-Recloser coordination. [8+8]

7. (a) Explain the effect of shunt compensation on distribution system.
   (b) A 3-phase substation transformer has a name plate rating of 7250KVA and a thermal capability of 120% of the name plate rating. If the connected load is 8816KVA with a 0.85pf lagging p.f., determine the following:
      i. The KVAR rating of the shunt capacitor bank required to decrease the KVA load of the transformer to its capability level.
      ii. The power factor of the corrected level. [6+10]

8. (a) Briefly explain the line drop compensation and voltage control.
   (b) How an AVB can control voltage? With the aid of suitable diagram explain its Function. [8+8]

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Code No: R05410210 **Set No. 2**

IV B.Tech I Semester Regular Examinations, November 2008
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(Electrical & Electronic Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Define coincidence factor and contribution factor.
   (b) Obtain the relation between the load factor and loss factor. [6+10]

2. (a) Explain radial type primary feeder with neat diagram.
   (b) Assume that feeder has a length of 2 miles and that the new feeder uniform loading has increased to 3 times the old feeder loading. Determine the new maximum length of the feeder with the same percent voltage drop if the new feeder voltage level is increased to 34.5kV from the previous voltage level of 12.47kV. [8+8]

3. Compute percent voltage drop of substation service area supplied with 'n' primary feeders. Assume load is uniformly distributed. [16]

4. A 1-Φ feeder circuit has total impedance (1+j3) ohms, receiving end voltage is 11kV and current is $50\angle -30^0$ A. Determine:
   (a) p.f. of load
   (b) load p.f. for which the drop is maximum
   (c) load p.f. for which impedance angle is maximum and derive the formula used. [16]

5. Describe the principle of operation of:
   (a) fuses
   (b) Circuit breakers
   (c) Line sectionalizer
   (d) circuit recloser. [4×4]

6. (a) Explain Recloser -Recloser coordination.
   (b) Explain Fuse-Circuit breaker coordination. [8+8]

7. 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]

8. (a) Write short notes on any two methods of 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]

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Code No: R05410210 **Set No. 3**

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronic Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is meant by load modeling and give their characteristics?
   (b) Define the following:
      i. Coincidence factor
      ii. Load factor
      iii. Loss factor
      iv. Contribution factor. [8+2×4]

2. (a) Draw and explain one line diagram of typical primary distribution feeder.
   (b) Draw and explain one line diagram of secondary network of the distribution feeder. [8+8]

3. Calculate % voltage drop of hexagonally shaped area of distribution substation. [16]

4. (a) Write about non - three phase primary lines.
   (b) Consider the 3 - phase, 3 wire 240 V secondary system with balanced loads at A, B and C as shown in figure 4b. Determine the following:

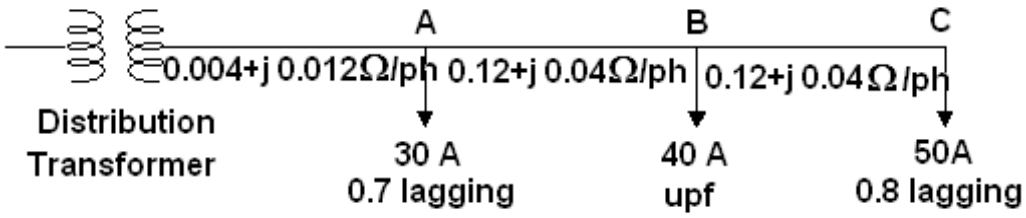

Figure 4b

      i. Calculate the total voltage drop
      ii. Calculate the kVA output and load p.f. of the distribution transformer
      iii. Calculate total power per phase for each load. [6+10]

5. (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]

6. (a) Explain Fuse-Circuit breaker coordination.
   (b) Explain Recloser- Circuit breaker coordination. [8+8]

7. Write detailed notes on the following:
   (a) Loss reduction due to capacitor compensation.
   (b) With the help of a phasor diagram, show how a series capacitor boosts the voltage? What are the drawbacks of this method? [8+8]

8. (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]

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Code No: R05410210 **Set No. 4**

IV B.Tech I Semester Regular Examinations, November 2008
ELECTRICAL DISTRIBUTION SYSTEMS
(Electrical & Electronic Engineering)

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

Answer any FIVE Questions
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1. (a) Prove that approximate formula for loss factor(F_{LS}) = $0.3F_{LD} + 0.7F_{LD}^2$, where F_{LD} = load factor.
   (b) The annual average load is 1241 kW and monthly peak load is 3600kW. Find the load factor and loss factor by using approximate formula. [8+8]

2. (a) What is meant by express feeder and give its importance in operation of radial type primary feeder?
   (b) Explain different connection diagrams of radial primary feeder. [6+10]

3. Discuss the benefits, which are derived through optimal location of substations. [16]

4. Derive an approximate voltage drop & power loss equation of primary feeder and give the condition for load p.f. at which voltage drop is maximum. [16]

5. (a) What are the objectives of Distribution system protection.
   (b) What are the advantages and disadvantages of fuses. [8+8]

6. (a) What is the data required for the general coordination procedure?
   (b) Explain Fuse-Fuse coordination. [8+8]

7. (a) Write notes on need for maintaining good voltage profile in power systems and need to improve power factor.
   (b) 3-Phase , 500H.P ,50Hz ,11KV star connected induction motor has a full load efficiency of 85% at lagging p.f of 0.75and is connected to a feeder. If it is desired to correct the p.f of 0.9 lagging load, determine the:
      i. The size of the capacitor bank in KVAR.
      ii. The capacitance of each unit if the capacitors are connect in delta as well as star. [8+8]

8. (a) Write a short notes on any two methods of voltage control?
   (b) Write the ways to improve the distribution system overall voltage regulation? [10+6]

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