Code No: R05220203 **Set No. 4**

II B.Tech II Semester Regular Examinations, Apr/May 2008
POWER SYSTEMS-I
(Electrical & Electronic Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. Draw a general layout of a modern thermal power plant and explain the working of different circuits. [16]

2. (a) Explain the function of moderator. How is a moderator selected? Why does a breeder reactor require no moderator?
   (b) Discuss the boiling water reactor, mentioning its merits and demerits. [10+6]

3. (a) Discuss briefly the requirements of a distribution system
   (b) A 2-wire DC ring distributor is 300m long and is fed at 240V at point A. At point B, 150m from A, a load of 120A is taken and at C, 100m in the opposite direction, a load of 80a is taken if the resistance per 100m of single conductor is 0.03Ω, find
      i. current in each section of distributor
      ii. voltage at points B and C. [8+8]

4. A 3-phase distribution system is shown in figure 4 Power is supplied at A at line voltage of 6.6 kV and balanced loads of 25A per phase at 0.8 lagging p.f and 35A per phase at 0.9 lagging p.f are taken at B and C respectively. The impedances of the feeders are AB = (5 + j9) Ω, BC = (6 + j10)Ω and CA = (4 + j8) Ω. Calculate the voltage at B and C and the current in each branch p.f.'s are assumed w.r. to voltage at A. [16]

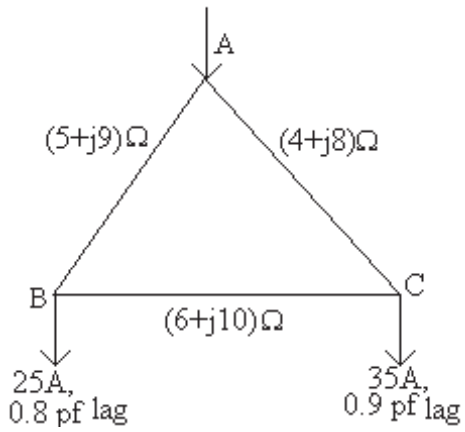

Figure 4

5. (a) What are the different types of bus bar arrangements?
   (b) Explain the single bus bar system with sectionalization and what its merits are as well as demerits. [6+10]

6. (a) Why the improvement of power factor is very important for both consumers and generating stations? List the various causes of low power factor and explain.

   (b) A single-phase motor takes a current of 10 amps at a p.f. of 0.707 lagging from a 230 V, 50 Hz supply. What value must a shunting capacitor have to raise the p.f. to unity. [8+8]

7. (a) Discuss the role of load factor on the cost of electrical energy.

   (b) From a load duration curve, the following data are available: the maximum demand on the system is 25 MW. The load supplied by two units is 15 MW and 12.5 MW. Unit no.1 acts as a base load unit and No.2 as a peak load unit. The base load unit works for 100% of the time and peak load unit for only 40% of time the energy generated by unit No.1 is 1×10^8 units and that by No.2 is 1×10^7 units. Determine the load factor, plant capacity factor and plant use factor of each unit and load factor of the total plant. [6+10]

8. What are the factors influencing tariff design and explain the various types of tariffs in detail. [16]

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