Code No: R05220203 **R05** **Set No. 2**

II B.Tech II Semester Examinations,April/May 2012
POWER SYSTEMS-I
Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Discuss in brief various methods of AC distribution.
   (b) A single-phase distributor 2 km long supplies a load of 120 A at 0.8 power factor lagging at its far end and a load of 80 A at 0.9 power factor lagging at its midpoint. Both power factors are referred to the voltage at the far end. The impedance per km (go and return) is (0.05+ j0.1) ohms. If the voltage at the far end is maintained at 230 V, determine the following
      i. Voltage at the sending end and
      ii. Phase angle between the voltages at both the ends. [8+8]

2. Explain the following in Nuclear reactor.
   (a) Moderator
   (b) control rods
   (c) coolants
   (d) Reflectors. [4+4+4+4]

3. (a) Explain the working of impulse turbine and how it is different from reaction turbine.
   (b) What are the different methods of compounding of steam turbines? [8+8]

4. (a) Define the terms: annual plant use factor and annual plant capacity factor of a power station and discuss the effect of these factors on the choice of the size and number of units, the reserve capacity of plant and the operating schedule of the station.
   (b) A consumer has the following connected loads: 15 lamps of 40W each and two heaters of 1,000W each. His maximum demand is 15000W. On the average he uses 10 lamps 5 hours a day and each heater for 3 hours a day. Find his average load, monthly energy consumption and load factor. [8+8]

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) Discuss the flat rate and block rate tariffs.

(b) A power station has an installed capacity of 20,000KW. The cost of the station is Rs. 1,200/kW. The fixed costs are 13% of the cost of investment on full load at 100% load factor, the variable costs of the station per year is 1.5 times the fixed costs. Assume that there is no reserve capacity of the plant and that are variable costs and proportional to energy production. Find the cost of generation per KWh at load factor of 100% and 20%. Comment on the results. [8+8]

7. (a) Write short notes on various systems of DC distribution.

   (b) A 250m, 2 wire DC distributor fed from one end is loaded uniformly at the rate of 1.6 A/m. The resistance of each conductor is 0.00012Ω per m. Find the voltage necessary at feed point to maintain 250V

      i. at the far end

      ii. at the mid point of the distributor. [8+8]

8. (a) What do you understand by power factor? Explain the necessity of improving power factor.

   (b) A consumer takes a steady load of 300 KW at a lagging p.f. of 0.7 for 3,000 hours a year. The tariff is Rs. 1,300 per KVA of maximum demand per annum plus Rs. 0.8 per KWh. The annual cost of the phase advancing is Rs. 130 per KVAR. Determine the annual saving if the p.f. of the load is improved. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220203 **R05** **Set No. 4**

II B.Tech II Semester Examinations,April/May 2012
POWER SYSTEMS-I
Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. Explain the following in Nuclear reactor.
   (a) Moderator
   (b) control rods
   (c) coolants
   (d) Reflectors. [4+4+4+4]

2. (a) Discuss in brief various methods of AC distribution.
   (b) A single-phase distributor 2 km long supplies a load of 120 A at 0.8 power factor lagging at its far end and a load of 80 A at 0.9 power factor lagging at its midpoint. Both power factors are referred to the voltage at the far end. The impedance per km (go and return) is (0.05+ j0.1) ohms. If the voltage at the far end is maintained at 230 V, determine the following
      i. Voltage at the sending end and
      ii. Phase angle between the voltages at both the ends. [8+8]

3. (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]

4. (a) Define the terms: annual plant use factor and annual plant capacity factor of a power station and discuss the effect of these factors on the choice of the size and number of units, the reserve capacity of plant and the operating schedule of the station.
   (b) A consumer has the following connected loads: 15 lamps of 40W each and two heaters of 1,000W each. His maximum demand is 15000W. On the average he uses 10 lamps 5 hours a day and each heater for 3 hours a day. Find his average load, monthly energy consumption and load factor. [8+8]

5. (a) Write short notes on various systems of DC distribution.
   (b) A 250m, 2 wire DC distributor fed from one end is loaded uniformly at the rate of 1.6 A/m. The resistance of each conductor is 0.00012Ω per m. Find the voltage necessary at feed point to maintain 250V
      i. at the far end
      ii. at the mid point of the distributor. [8+8]

6. (a) Discuss the flat rate and block rate tariffs.

   (b) A power station has an installed capacity of 20,000KW. The cost of the station is Rs. 1,200/kW. The fixed costs are 13% of the cost of investment on full load at 100% load factor, the variable costs of the station per year is 1.5 times the fixed costs. Assume that there is no reserve capacity of the plant and that are variable costs and proportional to energy production. Find the cost of generation per KWh at load factor of 100% and 20%. Comment on the results. [8+8]

7. (a) What do you understand by power factor? Explain the necessity of improving power factor.

   (b) A consumer takes a steady load of 300 KW at a lagging p.f. of 0.7 for 3,000 hours a year. The tariff is Rs. 1,300 per KVA of maximum demand per annum plus Rs. 0.8 per KWh. The annual cost of the phase advancing is Rs. 130 per KVAR. Determine the annual saving if the p.f. of the load is improved. [8+8]

8. (a) Explain the working of impulse turbine and how it is different from reaction turbine.

   (b) What are the different methods of compounding of steam turbines? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220203 **R05** **Set No. 1**

II B.Tech II Semester Examinations,April/May 2012
POWER SYSTEMS-I
Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Write short notes on various systems of DC distribution.
   (b) A 250m, 2 wire DC distributor fed from one end is loaded uniformly at the rate of 1.6 A/m. The resistance of each conductor is 0.00012Ω per m. Find the voltage necessary at feed point to maintain 250V
      i. at the far end
      ii. at the mid point of the distributor. [8+8]

2. (a) Define the terms: annual plant use factor and annual plant capacity factor of a power station and discuss the effect of these factors on the choice of the size and number of units, the reserve capacity of plant and the operating schedule of the station.
   (b) A consumer has the following connected loads: 15 lamps of 40W each and two heaters of 1,000W each. His maximum demand is 15000W. On the average he uses 10 lamps 5 hours a day and each heater for 3 hours a day. Find his average load, monthly energy consumption and load factor. [8+8]

3. Explain the following in Nuclear reactor.
   (a) Moderator
   (b) control rods
   (c) coolants
   (d) Reflectors. [4+4+4+4]

4. (a) Discuss the flat rate and block rate tariffs.
   (b) A power station has an installed capacity of 20,000KW. The cost of the station is Rs. 1,200/kW. The fixed costs are 13% of the cost of investment on full load at 100% load factor, the variable costs of the station per year is 1.5 times the fixed costs. Assume that there is no reserve capacity of the plant and that are variable costs and proportional to energy production. Find the cost of generation per KWh at load factor of 100% and 20%. Comment on the results. [8+8]

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) What do you understand by power factor? Explain the necessity of improving power factor.

   (b) A consumer takes a steady load of 300 KW at a lagging p.f. of 0.7 for 3,000 hours a year. The tariff is Rs. 1,300 per KVA of maximum demand per annum plus Rs. 0.8 per KWh. The annual cost of the phase advancing is Rs. 130 per KVAR. Determine the annual saving if the p.f. of the load is improved. [8+8]

7. (a) Explain the working of impulse turbine and how it is different from reaction turbine.

   (b) What are the different methods of compounding of steam turbines? [8+8]

8. (a) Discuss in brief various methods of AC distribution.

   (b) A single-phase distributor 2 km long supplies a load of 120 A at 0.8 power factor lagging at its far end and a load of 80 A at 0.9 power factor lagging at its midpoint. Both power factors are referred to the voltage at the far end. The impedance per km (go and return) is (0.05+ j0.1) ohms. If the voltage at the far end is maintained at 230 V, determine the following

      i. Voltage at the sending end and

      ii. Phase angle between the voltages at both the ends. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: R05220203 **R05** **Set No. 3**

II B.Tech II Semester Examinations,April/May 2012
POWER SYSTEMS-I
Electrical And Electronics Engineering

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Define the terms: annual plant use factor and annual plant capacity factor of a power station and discuss the effect of these factors on the choice of the size and number of units, the reserve capacity of plant and the operating schedule of the station.
   (b) A consumer has the following connected loads: 15 lamps of 40W each and two heaters of 1,000W each. His maximum demand is 15000W. On the average he uses 10 lamps 5 hours a day and each heater for 3 hours a day. Find his average load, monthly energy consumption and load factor. [8+8]

2. (a) What do you understand by power factor? Explain the necessity of improving power factor.
   (b) A consumer takes a steady load of 300 KW at a lagging p.f. of 0.7 for 3,000 hours a year. The tariff is Rs. 1,300 per KVA of maximum demand per annum plus Rs. 0.8 per KWh. The annual cost of the phase advancing is Rs. 130 per KVAR. Determine the annual saving if the p.f. of the load is improved. [8+8]

3. (a) Write short notes on various systems of DC distribution.
   (b) A 250m, 2 wire DC distributor fed from one end is loaded uniformly at the rate of 1.6 A/m. The resistance of each conductor is 0.00012Ω per m. Find the voltage necessary at feed point to maintain 250V
      i. at the far end
      ii. at the mid point of the distributor. [8+8]

4. (a) Discuss the flat rate and block rate tariffs.
   (b) A power station has an installed capacity of 20,000KW. The cost of the station is Rs. 1,200/kW. The fixed costs are 13% of the cost of investment on full load at 100% load factor, the variable costs of the station per year is 1.5 times the fixed costs. Assume that there is no reserve capacity of the plant and that are variable costs and proportional to energy production. Find the cost of generation per KWh at load factor of 100% and 20%. Comment on the results. [8+8]

5. Explain the following in Nuclear reactor.
   (a) Moderator
   (b) control rods
   (c) coolants

(d) Reflectors. [4+4+4+4]

6. (a) Discuss in brief various methods of AC distribution.

   (b) A single-phase distributor 2 km long supplies a load of 120 A at 0.8 power factor lagging at its far end and a load of 80 A at 0.9 power factor lagging at its midpoint. Both power factors are referred to the voltage at the far end. The impedance per km (go and return) is (0.05+ j0.1) ohms. If the voltage at the far end is maintained at 230 V, determine the following

      i. Voltage at the sending end and

      ii. Phase angle between the voltages at both the ends. [8+8]

7. (a) Explain the working of impulse turbine and how it is different from reaction turbine.

   (b) What are the different methods of compounding of steam turbines? [8+8]

8. (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]

⋆ ⋆ ⋆ ⋆ ⋆