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Code No: T0221





II B. Tech II Semester Supplementary Examinations April/May– 2013 POWER SYSTEMS - I

(Electrical and Electronics Engineering)

Max. Marks: 80

Time: 3 hours

Answer any **FIVE** Questions All Questions carry **Equal** Marks

- 1. a) What are the factors to be considered for selection of the site for a thermal power station?
 - b) How the coal is utilized in power generation? Describe how it is handled starting from delivery of coal to final combustion stage?
- 2. a) Discuss the advantages and disadvantages of Nuclear power stationb) What are factors to be considered for the selection of site of a nuclear power station?
- 3. a) Explain how the distributions systems are classified?b) Discuss the relative merits and demerits of underground and overhead systems.
- 4. a) Give the importance of load power factors in AC distribution system.
 - b) A single phase distributor one km long has resistance and reactance per conductor of 0.1 ohm and 0.15 ohm respectively. At the far end, the voltage $V_B=200V$ and the current is 100 A at a p.f of 0.8 lagging. At the mid-point M of the distributor, a current of 100 A is tapped at a p.f. of 0.6 lagging with reference to the voltage V_M at the mid-point . Calculate i) voltage at mid-point ii) sending end voltage V_A
- 5. a) What are the advantages of Gas insulated sub-stations?b) What are the considerations for the selection of site for an out-door sub-station.
- 6. a) Derive an expression for the most economized value of power factor which may be attained by a consumer
 - b) Discuss the disadvantages of a low power factor?
- 7. Define and explain importance of the following
 - a) Connected load
 - b) Maximum load
 - c) Demand factor
- 8. What is mean by power factor tariff? Describe some of the important types of tariffs commonly used?

1 of 1

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Answer any **FIVE** Questions All Questions carry **Equal** Marks

- a) Briefly describe the components of TPS (Thermal Power Station)?
 b) A steam power station has an overall efficiency of 20% and 0.6Kg of coal is burnt per KWh of electrical energy generated. Calculate the calorific value of fuel.
- 2. a) What are the basic components of nuclear reactor? Explain the function of each component.b) Describe the principle and operation of Gas Power Plant?
- 3. a) Explain the main types of distribution systems used and compare their applications.b) What are the requirement s of a distribution system.
- A single phase a.c. distributor AB 300 meters long is fed from end A and is loaded as under:
 i) 100A at 0.707 p.f. lagging 200 m from point A
 - ii) 200A at 0.8 p.f. lagging 300 m from point A

The load resistance and reactance of the distributor is 0.2 ohm and 0.1 ohm per kilometer. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.

- 5. What are the different types of bus-bar arrangements used in sub-stations? Illustrate your answer with suitable diagram.
- 6. a) What is the importance of power factor in the supply system? And why is the power factor not more than unity?

b) What are the various methods of voltage control in a power system?

7.	Explain briefly		
	a) Load duration curve	b) Load curve	c) plant use factor.
8.	Write short notes on		
	a) Simple tariff	b) Flat rate tariff	c) Three part tariff

1 of 1

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SET - 3

II B. Tech II Semester Supplementary Examinations April/May– 2013 POWER SYSTEMS - I

(Electrical and Electronics Engineering)

Max. Marks: 80

Time: 3 hours

Answer any **FIVE** Questions All Questions carry **Equal** Marks

- 1. Briefly describe the main parts and the working of a steam power station with a neat sketch?
- a) What are the methods of producing nuclear reaction? What is chain reaction?b) Explain the types of Nuclear Reactors?
- 3. a) Give the comparison between over head system and underground system.b) Explain the differentiation between A.C distribution and D.C distribution.
- 4. a) What are the undesirable effects of too much voltage variation on a distribution circuit?
 - b) A single phase distributor 2kilometers long supplies a load of 120 A at 0.8 p.f. lagging at its far end and a load of 80 A at 0.9 p.f. lagging at its mid-point. Both power factors are referred to the voltage at the far end. The resistance and reactance per Km (go and return) are 0.050hm and 0.1 ohm respectively. If the voltage at the far end is maintained at 230V, calculate the voltage at sending end.
- 5. a) Define sub-station? Mention the factors that should be taken care of while designing and erecting a substation.
 - b) Give the comparison between Air insulated sub-stations and Gas insulated sub-stations
- 6. a) What is the effect of low power factor on the generating stations?b) Explain with a neat sketch on-load tap changing transformer.
- 7. Write short notes on the following terms:
 - a) Diversity factor
 - b) Demand factor
 - c) Utilization factor.
- 8. a) What do you understand by tariff? Discuss the objectives of tariff.b) Describe the desirable characteristics of a tariff?

1 of 1

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II B. Tech II Semester Supplementary Examinations April/May– 2013 POWER SYSTEMS - I

(Electrical and Electronics Engineering)

Max. Marks: 80

Time: 3 hours

b) A

Answer any FIVE Questions		
All Questions carry Equal Marks		
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1. a) What are the functions of economizer and super heater in a thermal power plant?

: Load factor	= 40%
: Turbine efficienc	y = 90%
: Cost of 1 ton of c	oal=Rs.300
	: Load factor : Turbine efficienc : Cost of 1 ton of c

Determine (i) thermal efficiency and (ii) coal bill per annum.

- 2. a) Define Nuclear Fission? Explain it briefly.
  - b) Explain about shielding and mention the safety precautions to be taken in nuclear power stations
- 3. a) Derive an expression for the voltage drop for a uniformly loaded distributor fed at one end.b) Write short notes on Ring main distributor.
- 4. a) Discuss the steps how you will solve a.c distribution problems.
  - b) A 500 m long single-phase A.C. distributor has a total impedance of (0.02+j0.04) ohm and is fed from one end at 240V. It is loaded as follows: 50A at unity power factor, 200m from feeding point; 100A at 0.8 p.f. lagging , 300m from feeding point ; 50A at 0.06 p.f. lagging at the far end. Calculate: i) Total voltage drop ii) voltage at the far end.
- 5. a) Give the comparison of out-door sub-stations and in-door sub-stations.b) Discuss the different types of gas insulated sub-stations.
- 6. a) Discuss the various methods for power factor improvement?b) Discuss the importance of voltage control in the modern power system.
- 7. a) What do you understand by the load curve? What information's are conveyed by a load curve?
  - b) A generating station has a connected load of 43MW and a maximum demand of 20MW. The unit generated being  $615 \times 10^6$  per annum. Calculate i) demand factor ii) load factor.
- 8. Write short notes on two-part tariff and power factor tariff. Also explain what is the effect of power factor on the cost of generation.

1 of 1

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