BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)
II - B. Tech II-Semester Supplementary Examinations (BR23), Aug - 2025
POWER SYSTEMS-I (EEE)

Time: 3 hours   Max. Marks: 70

Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B

PART–A (10X2 = 20M)

			Marks	CO	BL
1. a)	Write a short note on economiser in thermal power plant.		(2M)	CO-1	L2
b)	Define cavitation. What is its effect on turbine?		(2M)	CO-1	L2
c)	Mention the materials used as control rods and shield in a nuclear reactor.		(2M)	CO-1	L1
d)	What is chain reaction?		(2M)	CO-1	L2
e)	What are the advantages of Indoor substation?		(2M)	CO-2	L2
f)	What is the function of isolator in substation?		(2M)	CO-2	L2
g)	What is capacitance grading in cables?		(2M)	CO-3	L2
h)	What are the main objectives of a tariff?		(2M)	CO-4	L2
i)	Define plant use factor.		(2M)	CO-4	L2
j)	What is the significance of depreciation in the economics of power generation?		(2M)	CO-4	L2

PART–B (5X10 = 50M)

2a.	Explain the principle of operation and components of Hydro power plant with neat diagram.	5(M)	CO-1	L2
b.	Explain the advantages and disadvantages of Hydro power plant.	5(M)	CO-1	L2
	(OR)			
3a.	Describe the working of Electro Static Precipitator with a neat sketch.	5(M)	CO-1	L2
b.	Explain the feed water circuit in thermal power plants with a neat sketch.	5(M)	CO-1	L2
4a.	Explain the Nuclear fission reaction.	5(M)	CO-1	L3
b.	Describe the working of nuclear reactor and explain about its components.	5(M)	CO-1	L2
	(OR)			
5a.	Describe working of PWR (pressurized water reactor). What are its advantages and disadvantages?	5(M)	CO-1	L3
b.	What are the factors to be considered for the selection of site of a nuclear power stations?	5(M)	CO-1	L2
6a.	Explain the main and transfer bus bar system with neat diagram.	5(M)	CO-2	L3
b.	Distinguish between Air insulated substation and Gas insulated substation.	5(M)	CO-2	L2
	(OR)			
7	Explain the constructional aspects of Gas Insulated Substation.	10(M)	CO-2	L2

8a.	Derive the expression for capacitance of a Single-Core Cable.	5(M)	CO-3	L3
b.	A single core cable has a conductor diameter of 1.2 cm and internal sheath diameter of 1·9 cm. If impregnated paper of relative permittivity 4 is used as the insulation, calculate the capacitance for 1 km length of the cable.	5(M)	CO-3	L3

(OR)

9a.	Prove that the insulation resistance is inversely proportional with the length of the cable.	5(M)	CO-3	L3
b.	b) The insulation of a single core cable is 500MΩ/km. if the core diameter is 2.6cm and resistivity is 5×10^{14} Ω-cm, find the insulation thickness.	5(M)	CO-3	L3

10a	Define the following (i) maximum demand, (ii) demand factor, (iii) load factor and (iv) diversity factor (v)Plant capacity factor	5(M)	CO-4	L2
b.	A power station has a maximum demand of 20000 kW. The annual load factor is 50% and plant capacity factor is 40%. Determine the reserve capacity of the plant.	5(M)	CO-4	L3

(OR)

11a	Write short notes on the following: i)Three part tariff ii) Time of day tariff iii) Time of use tariff	5(M)	CO-4	L2
b.	A factory has a maximum load of 240 kW at 0.8 p.f. lagging with an annual consumption of 50,000 units. The tariff is Rs 50 per KVA of maximum demand plus 10 paise per unit. Calculate the flat rate of energy consumption. What will be annual saving if p.f. is raised to unity?	5(M)	CO-4	L3

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