

Code: 23EE3401

**II B.Tech - II Semester – Regular Examinations - MAY 2025****POWER SYSTEMS - I  
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.

2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.

3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.

4. All parts of Question paper must be answered in one place.

BL – Blooms Level

CO – Course Outcome

**PART – A**

		BL	CO
1.a)	Judge why the overall efficiency of a steam power station is very low.	L4	CO1
1.b)	Examine why hydroelectric stations have high transmission and distribution costs?	L4	CO2
1.c)	Define Nuclear Fission.	L2	CO2
1.d)	Mention the function of Moderator in Nuclear power plant.	L3	CO3
1.e)	Infer the features of single bus bar and sectionalized single bus bar.	L3	CO3
1.f)	List out the advantages of gas insulated substations	L2	CO3
1.g)	Classify Cables.	L1	CO3
1.h)	Sketch the single line diagram of typical low tension distribution system.	L3	CO4
1.i)	Define economics of power generation.	L2	CO4

1.j)	A consumer has a maximum demand of 200kW at 40% load factor. If the tariff of Rs.100 per kW of maximum demand plus 10 paise per kWh, find the overall cost per kWh.	L4	CO5
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### PART – B

			BL	CO	Max. Marks
<b>UNIT-I</b>					
2	Draw the schematic diagram of a modern Steam power station and explain its operation.		L3	CO2	10 M
<b>OR</b>					
3	a) Explain the functions of the following: <ul style="list-style-type: none"> <li>i. Dam</li> <li>ii. Spilways</li> <li>iii. Surge tank</li> <li>iv. Headworks</li> <li>v. Draft tube</li> </ul>		L3	CO2	5 M
	b) Discuss the merits and demerits of a hydro electric plant.		L2	CO1	5 M
<b>UNIT-II</b>					
4	Illustrate about Pressurized Water Reactor, Boiling water Reactor and Fluidized Bed Reactor.		L2	CO2	10 M
<b>OR</b>					
5	Compare and analyze the operations of Hydroelectric, Thermal and Nuclear Power stations.		L4	CO2	10 M

UNIT-III					
6	Examine the substations layout of 33/11 kV showing the location of all the substation equipment.		L4	CO3	10 M
OR					
7	a)	Illustrate the key aspects of Gas Insulated Substations (GIS).	L2	CO3	5 M
	b)	Analyse air insulated substations and gas insulated substations by comparing their features and installations.	L4	CO3	5 M
UNIT-IV					
8	Elaborate the capacitance and Intersheath grading with the derivation and Analyse disadvantages of both grading.		L3	CO4	10 M
OR					
9	a)	Infer the connection schemes of Distribution system with relevant layouts.	L4	CO4	5 M
	b)	Illustrate the requirements of Distribution system.	L2	CO4	5 M
UNIT-V					
10	Explain the following terms w.r.t economic of a plant i. Load factor ii. Diversity factor iii. Plant capacity factor iv. Plant use factor		L4	CO4	10 M
OR					

11	<p>An electric supply company having a maximum load of 50 MW generates <math>18 \times 10^7</math> units per annum and the supply consumers have an aggregate demand of 75 MW. The annual expenses including capital charges are:</p> <ul style="list-style-type: none"> <li>i. For fuel = Rs 90 lakhs</li> <li>ii. Fixed charges concerning generation = Rs 28 lakhs</li> <li>iii. Fixed charges concerning transmission and distribution = Rs 32 lakhs.</li> </ul> <p>Assuming 90% of the fuel cost is essential to running charges and the loss in transmission and distribution as 15% of kWh generated, deduce a two part tariff to find the actual cost of supply to the consumers.</p>	L4	CO4	10 M
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