

HALL TICKET NUMBER

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PACE INSTITUTE OF TECHNOLOGY & SCIENCES::ONGOLE  
(AUTONOMOUS)

IV B.TECH I SEMESTER END REGULAR EXAMINATIONS, NOV-2022  
POWER SYSTEM OPERATION AND CONTROL  
(EEE Branch)

Time: 3 hours

Max. Marks: 60

Note: Question Paper consists of Two parts (Part-A and Part-B)

**PART-A**Answer **all** the questions in Part-A (5X2=10M)

Q.No.	Questions	Marks	CO	KL
1.	a) What are the components of a Production Cost of power?	[2M]	1	1
	b) What are the advantages of operation of hydrothermal combinations?	[2M]	2	1
	c) What is the concept of control area in load frequency control of power system?	[2M]	3	1
	d) What is need for unit commitment in power system?	[2M]	4	2
	e) What are the sources for reactive power?	[2M]	5	1

**PART-B**Answer **One Question from each UNIT** (5X10=50M)

Q.No.	Questions	Marks	CO	KL
UNIT-I				
2.	Determine the Condition for Optimal generation allocation of a power system with 'n' plants by neglecting the transmission losses.	[10M]	1	3
OR				
3.	A constant load of 400 MW is supplied by two 210-MW generators 1 and 2, for which the fuelcost characteristics are given as below: $C_1 = 0.05 P_1 + 20 P_1^2 + 30.0 \text{ Rs./hr}$ $C_2 = 0.06 P_2 + 15 P_2^2 + 40.0 \text{ Rs./hr}$ The real-power generations of units $P_1$ and $P_2$ are in MW. Determine: (i) the most economical load sharing between the generators. (ii) The saving in Rs./day there by obtained compared to the equal load sharing between two generators.	[10M]	1	3
UNIT-II				
4.	Derive the condition for optimality of short-term hydrothermal scheduling problem using Kirch-mayers Method.	[10M]	2	4
OR				
5.	a) Explain the advantages of operation of Hydrothermal System.	[5M]	2	2
	b) Explain the factors on which economic operation of a combined hydrothermal system depends?	[5M]	2	2
UNIT-III				
6.	a) Explain the necessity to maintaining a constant frequency in power system operation.	[5M]	3	2
	b) Describe the schematic diagram of a speed governing system with the function of its components.	[5M]	3	3
OR				
7.	a) Obtain the dynamic response of load frequency control of power system with integral control action.	[5M]	3	4
	b) Distinguish between load frequency control and economic dispatch control.	[5M]	3	2

UNIT-IV					
8.	a)	Describe the constraints used in unit commitment problem.	[5M]	4	2
	b)	Explain the cost function for unit commitment.	[5M]	4	2
OR					
9.		Explain the Optimal unit commitment problem using Dynamic programming approach.	[10M]	4	3
UNIT-V					
10.	a)	Explain the need of reactive power control in power system.	[5M]	5	2
	b)	What are the different types of compensating equipment for transmission systems?	[5M]	5	1
OR					
11.	a)	Explain the specifications of load compensator.	[5M]	5	2
	b)	Explain need for FACTS controllers in transmission systems.	[5M]	5	2

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