O.P.Code: 20EE0224	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. III Year II Semester Regular & Supplementary Examinations June-2025
POWER SYSTEM OPERATION AND CONTROL
(Electrical and Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Briefly explain about Input-output characteristics, Heat rate curve and Cost curve of thermal power station.	CO1	L3	6M
	b	Define objective function and briefly explain about an incremental fuel cost of thermal power station.	CO1	L2	6M

OR

2		The fuel inputs per hour of plants 1 and 2 are given as $F1=0.2P_1^2+40P_1+120$ Rs/hr, $F2=0.25P_2^2+30P_2+150$ Rs/hr. Determine the economic operating schedule and the corresponding cost of generation if the maximum and minimum loading on each unit is 100MW and 25MW, the demand is 180MW, and transmission losses are neglected. If the load is equally shared by both units, determine the saving obtained by loading the units as per equal incremental production cost.	CO1	L3	12M

UNIT-II

3	a	Define optimization problem of hydro-thermal system and Describe the types of hydro-thermal co-ordination.	CO2	L3	6M
	b	With neat figures explain the classification of hydro power plant.	CO2	L2	6M

OR

4		Derive the condition for optimality of short-term hydro-thermal scheduling problem.	CO2	L3	12M

UNIT-III

5		Two generating stations A and B have full load capacities of 200MW and 75MW respectively. The inter connector connecting the two stations has an induction motor /synchronous generator (plant (C) of full load capacity 25MW near station. A percentage changes of speed of A, B and C are 5, 4 and 3 respectively. The loads on bus bars A and B are 75MW and 30MW respectively. Determine the load taken by the set C and indicate the direction of power flow.	CO3	L3	12M

OR

6	a	Explain about first order turbine model.	CO3	L2	6M
	b	Sketch the schematic diagram of speed governor system.	CO3	L3	6M

UNIT-IV

7	a	Why frequency of the power system should be kept constant?	CO4	L3	6M
	b	Discuss in detail the importance of load frequency control.	CO4	L2	6M

OR

8		Give typical block diagram for a two-area system inter connected by tie line and explain each block.	CO4	L3	12M

UNIT-V

9	a	What are the advantages and disadvantages of different types of compensating equipment for transmission systems?	CO5	L2	6M
	b	Explain about static var compensators.	CO5	L3	6M

OR

10		A load of (15+j10)MVA is supplied with power from a generating station from a line at 110KV 3 phase 50HZ. The line is 100Km length. The line is represented by π model with the parameters R=26.4ohms, X=33.9ohms, B=$219*10^{-6}$ voltage at the generated in 116KV. Determine the power supplied by the generating station.	CO5	L3	12M

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