CODE No.: 16BT70201 SVEC-16

SREE VIDYANIKETHAN ENGINEERING COLLEGE

(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)

IV B.Tech I Semester (SVEC-16) Regular/Supplementary Examinations February - 2021

POWER SYSTEM OPERATION AND CONTROL
[Electrical and Electronics Engineering]

Time: 3 hours **Max. Marks: 70**

Answer One Question from each Unit
All questions carry equal marks

UNIT-I

1.	a)	Derive the condition for economical load dispatch among various generating plants by considering transmission losses.	CO2	7 Marks
	b)	Explain the importance of load forecasting and explain any one method of load forecasting.	CO1	7 Marks
		(OR)		
2.	a)	Derive transmission line loss equation in terms of B-Coefficients.	CO2	7 Marks
	b)	Incremental fuel costs in Rs/MWh for a plant consisting of two units are $\frac{df_1}{dpg_1} = 0.2pg_1 + 40 \qquad \frac{df_2}{dpg_2} = 0.25pg_2 + 30$ Assume both units are operating at all times and total load varies from 40MW to 250MW and maximum and minimum loads are to be 125 and 20MW respectively. How will the loads be shared between the two units as the system load varies in steps of 50MW over full range? What are the corresponding values of the plant incremental costs?	CO6	7 Marks

UNIT-II

3.	a)	Derive the coordination equation for the optimal scheduling of hydrothermal interconnected power plants.	CO4	7 Marks
	b)	Explain short term hydro scheduling by $\gamma - \lambda$ iteration method.	CO5	7 Marks
		(OR)		
4.		Describe the hydro-thermal economic load scheduling. Derive the necessary equations.	CO4	14 Marks

UNIT-III

5.	a)	Develop the mathematical model for the forward Dynamic programming algorithm, taking into account the start up costs of the units	CO2	8 Marks
	b)	Draw the flowchart for the Priority list method of unit commitment.	CO2	6 Marks
		(OR)		
6.	a)	Explain the procedure for solving Unit commitment problem using Priority list scheme based on simple shutdown algorithm.	CO1	8 Marks
	b)	Explain the various constraints in unit commitment problem.	CO1	6 Marks

UNIT-IV

7.	a)	Draw the block representation of a complete DC excitation system and explain its features.	CO1	7 Marks
	b)	Explain the block diagram representation of IEEE Type-1 excitation system.	CO5	7 Marks
		(OR)		

8.	a)	Derive the transfer function of Generator – load model of power system	CO2	7 Marks
	b)	Explain the block diagram of LFC system.	CO1	7 Marks

UNIT-V

9.	a)	Derive dynamic response of a load frequency control of an isolated power system.	CO2	7 Marks
	b)	Draw a block diagram, with illustrative transfer function of a single area frequency control system. Explain the function of different components of such a control system.	CO1	7 Marks

(OR)

10.	a)	Derive the expression for the change in tie-line power when the loads change in the control areas.	CO4	7 Marks
	b)	Two areas are connected with a tie line .The characteristics are as follows. Area 1 : R=0.015 , D=0.8 , base MVA =500 Area 2 : R=0.01 pu ,D=1 pu , base MVA =500 A load change of 100 MW occurs in area 1 .What is the new frequency and tie-line flow change .The nominal frequency is 50 Hz.	CO6	7 Marks