



R20 Regulation

Subject code: 3P6BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VI Semester Regular/Supplementary Examinations, July 2024**POWER SYSTEM OPERATION AND CONTROL
(EEE)****Maximum Marks: 70**

Date:24.07.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks		(10X2M=20 Marks)	CO	Bloom Tx
1	List out the objectives of economic load dispatch of power system?		1	2
2	Draw Input-output curve of IFC.		1	1
3	Draw the incremental cost curve of thermal unit.		2	2
4	Distinguish between Base load method and best point loading?		2	3
5	What is meant by automatic load- frequency control?		3	4
6	Define tie line bias control?		3	1
7	List out the advantages of compensating equipment?		4	2
8	What are the specifications of load compensator?		4	2
9	What is the function of energy control center?		5	1
10	What is meant by state estimation?		5	1

Part-B

Answer All the following questions.		(5X10M=50Marks)		
11	<p>150 MW, 220 MW and 220 MW are the ratings of three units located in a thermal power station. Their respective incremental costs are given by the following equations:</p> $\frac{dC_1}{dP_1} = Rs. (0.11P_1 + 12)$ $\frac{dC_2}{dP_2} = Rs. (0.095P_2 + 14)$ $\frac{dC_3}{dP_3} = Rs. (0.1P_3 + 13)$ <p>Where P1, P2 and P3 are the loads in MW. Determine the economical load allocation between the three units, when the total load on the station is (i) 350 MW (ii) 500 MW. [10]</p>		1	4
OR				
12	A. Discuss in detail about various Power System constraints related to Economic operation of power systems? [5]		1	2

	B. Derive generalized expression for transmission loss in a n-bus network. [5]	1	1
13	Obtain the dynamic response of change in frequency of isolated power system with block diagram. [10]	2	2
	OR		
14	A. Describe Short term Hydrothermal scheduling problem. [5] B. Explain IEEE Type-1 model with neat block diagram. [5]	2 2	1 1
15	A. What is the importance of making frequency constant? [5] B. Two generating stations A and B having capacities 500 and 800MW, respectively are interconnected by a short line. The percentage speed regulations from no-load to full load of the two stations are 2 and 5, respectively. Find the power generation at each station and power transfer through the line if the load on the bus of each station is 200MW. [5]	3 3	2 1
	OR		
16	Discuss the effect of proportional plus integral control action with economic load dispatch on single area load frequency system. [10]	3 3	3 2
17	Describe in detail the various reactive power compensation techniques used in a transmission system with their advantages and disadvantages. [10]	4	1
	OR		
18	A. Explain the Static shunt capacitor Compensator and Static series capacitor Compensator for System Control. [5] B. Write the specifications of load compensator. [5]	4 4	2 1
19	Briefly explain the major components of a SCADA system. [10]	5	1
	OR		
20	Write short notes on a) EMS b) State transition diagram showing various states [5+5]	5	2