



R20 Regulation

Subject code: 3P6BC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, November 2025

POWER SYSTEM OPERATION AND CONTROL

(EEE)

Maximum Marks: 70

Date: 11.11.2025

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 only one full question from each unit.
 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)		Marks	CO	BTL
1	Write the coordinate equation.	2M	1	L1
2	What are the units of B-coefficients.	2M	1	L1
3	What is the need of a fly-ball speed governor?	2M	2	L1
4	What is hydro thermal scheduling?	2M	2	L1
5	What are the basic components of an integral controller?	2M	3	L1
6	What is load frequency control?	2M	3	L1
7	What is load compensation?	2M	4	L1
8	List the reactive power control devices.	2M	4	L1
9	Define SCADA.	2M	5	L1
10	Define data acquisition.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	<p>The fuel inputs to two plants are given by</p> $F_1 = 0.015 P_1^2 + 16P_1 + 50$ $F_2 = 0.025 P_2^2 + 12P_2 + 30$ <p>The loss coefficients of the system are given by $B_{11} = 0.005$; $B_{12} = -0.0012$ and $B_{22} = 0.002$. The load to be met is 200 MW. Determine the economic operating schedule and the corresponding cost of generation if the transmission line losses are coordinated.</p>	10M	1	L2
OR				
12	Give algorithm for economic allocation of generation among generators of a thermal system neglecting transmission losses. Give steps for implementing this algorithm, and also derive necessary equations.	10M	1	L2
13	Explain about the short term of hydro thermal scheduling.	10M	2	L2
OR				
14	Derive the modeling of excitation system and its fundamental characteristics of an excitation system.	10M	2	L2

15	Explain about speed governing system with neat diagram.	10M	3	L2
	OR			
16	Explain about load frequency control of single area control block diagram representation.	10M	3	L2
17	Explain the shunt and series compensations with neat diagrams.	10M	4	L2
	OR			
18	Why is voltage control required in power systems? Mention the different methods of voltage control employed in power system. Explain one method of voltage control in detail giving a neat connection diagram.	10M	4	L2
19	What is EMS? What are its major functions in power system operation and control?	10M	5	L2
	OR			
20	Briefly discuss the various functions of energy control center.	10M	5	L2