R20 Regulation *Subject code: 3P6BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, April 2026

POWER SYSTEM OPERATION AND CONTROL

(EEE)

Maximum Marks: 70 Date: 18.04.2026 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.
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-coefficents.	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	Write the formula for a synchronizing coefficient.	2M	3	L1
7	Define voltage stability.	2M	4	L1
8	What are the objectives of load compensation?	2M	4	L1
9	What are the functions of SCADA?	2M	5	L1
10	What are the different operating states of a power system?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	A power system consists of two 100MW units whose input cost data are represented by equations below. $C_1 = 0.04P_1^2 + 22\,P_1 + 800$ Rupees/hour $C_2 = 0.045P_2^2 + 15\,P_2 + 1000$ Rupees/hour It total received power $P_R = 150$MW. Determine the load sharing between units for economic operation.	10M	1	L2
	OR			
12	Write short notes on: i) Equality constraints ii) Inequality Constraints	5M 5M	1	L2
13	Explain about the hydrothermal scheduling problem.	10M	2	L2
	OR			
14	Derive the mathematical modeling of speed governing system.	10M	2	L2
15	Explain about load frequency control of two area control block diagram representing power system.	10M	3	L2
	OR			

16	Derive the proportional plus integral control of single area and its block diagram representation.	10M	3	L2
17	Compare the different types of compensating equipment for transmission systems.	10M	4	L2
	OR			
18	Describe 'off-load' and 'on-load' tap-changing transformers.	10M	4	L2
19	Explain the hardware components of SCADA with neat diagram and also mention the functions of it.	10M	5	L2
	OR			
20	Explain the different operating states of power system with state transition diagram.	10M	5	L2