



R20 Regulation **Subject code:3P5BC**
TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech V Semester Supplementary Examinations, December 2024

POWER SYSTEMS-II
(EEE)

Maximum Marks: 70

Date:03.01.2025

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 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	What are main components of overhead lines	1	L1
2	What is the GMD&GMR?	1	L1
3	Draw the phasor diagram of nominal T method	2	L1
4	Compare nominal T method and Pi method	2	L1
5	Define critical impedance and SIL of long line.	3	L1
6	What are the generalized constants(A,B,C,D)of long line?	3	L1
7	Write the power factors improving methods?	4	L1
8	Draw the bewley lattice diagram.	4	L1
9	What is sag and tension?	5	L1
10	Write short notes on stringing chart?	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		CO	Bloom Tx
11	Derive the expression for inductance of a three phase double circuit line with Unsymmetrical spacing (Transposed Lines). [10M]	1	L2
OR			
12	Derive the expression for the capacitance of a conductor in a three phase line with symmetrical spacing? [10M]	1	L2
13	A) Develop the A, B, C and D constants of medium transmission lines using nominal T method. [5M] B) Explain End condenser method in medium transmission line. [5M]	2	L2
OR			
14	A single-phase transmission line delivers 2 MW be of power at the receiving end at a voltage of 33 kV and 0.9 p.f. lagging. The total resistance of the line is 10 ohm and the total inductive reactance is 18 ohm. Determine : [10M] (i) Percentage voltage regulation (ii) Sending end power factor (iii) Transmission efficiency.	2	L4

15	Derive the sending end voltage and current in long transmission line using Rigorous method and evaluate the ABCD parameters. [10M]	3	L2
	OR		
16	A 3- ϕ transmission line 200 km long has the following constants: Resistance/phase/km = 0.16Ω Reactance/phase/km = 0.25Ω Shunt admittance/phase/km = $1.5 \times 10^{-6} \text{ S}$ Calculate by rigorous method the sending end voltage and current when the line is delivering a load of 20 MW at 0.8 p.f. lagging. The receiving end voltage is kept constant at 110 kV. [10M]	3	L4
17	a) What is a travelling wave? Explain the development of such a wave on an overhead line and discuss the phenomenon of wave reflection and refraction [5M] b) Explain termination of lines with Resistance for different types of conditions i) Open Circuited Line ii) Short Circuited Line [5M]	4	L2
	OR		
18	How the corona forms in power systems and write the advantages and disadvantages. [10M]	4	L2
19	Derive the sag expression for a transmission line at equal level supports. [10M]	5	L3
	OR		
20	Develop the mathematical expression for potential distribution over a string of suspension type insulators. [10M]	5	L3