R20 Regulation *Subject code: 3P5BC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech V Semester Supplementary Examinations, April 2026

POWER SYSTEMS-II

(EEE)

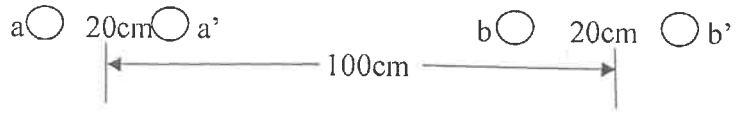
Maximum Marks: 70 Date: 22.04.2026 Duration: 3 hours

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	What are main components of overhead lines?	2M	1	L1
2	Define GMD & GMR.	2M	1	L1
3	Write equations for A B C D parameters of Nominal-T method of medium transmission line.	2M	2	L1
4	Define voltage regulation and efficiency of transmission line.	2M	2	L1
5	Write the characteristics impedance and propagation constant.	2M	3	L1
6	What are the generalized constants(A,B,C,D)of long line?	2M	3	L1
7	Write about Corona.	2M	4	L1
8	What is Travelling Wave Phenomenon?	2M	4	L1
9	How the electrical breakdown can occur in an insulator.	2M	5	L1
10	Write short notes on effect of wind and ice loading.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a single phase line as shown in Fig. conductors a and a' in parallel form one conductor while conductors b and b' in parallel form the return path. Calculate the total inductance of the line per km assuming that current is equally shared by the two parallel conductors. Conductor diameter is 2.0 cm.  Fig.	10M	1	L2
	OR			
12	a) Derive the expression for the capacitance of a conductor in a double circuit hexagonal spaced three phase system. b) Discuss the effect of ground on capacitance.	6M 4M	1	L2
13	a) Develop the A, B, C and D constants of medium transmission lines using nominal T method.	5M	2	L2

	b) Explain End condenser method in medium transmission line.	5M		
	OR			
14	A three phase transmission line is 135 km long. The series impedance is Z=0.04 + j 0.95 ohm per phase per km, and shunt admittance is Y=j 5.1×10−6 mho per phase per km. The sending end voltage is 132 kV and the sending end current is 154 A at 0.9 power factor lagging. Determine the voltage, current and power at the receiving end and the voltage regulation using medium line-T model.	10M	2	L2
15	Derive the expressions for VS, IS and A B C D parameter with analysis of Long Transmission Line (Rigorous method).	10M	3	L2
	OR			
16	A 3-φ transmission line 200 km long has the following constants: Resistance/phase/km = 0·16 Ω Reactance/phase/km = 0·25 Ω Shunt admittance/phase/km = 1·5 × 10–6 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	L2
17	a) Derive travelling wave equation. b) Write short notes on Ferranti effect.	5M 5M	4	L2
	OR			
18	Discuss the phenomenon of wave reflection and refraction. Derive expression for reflection and refraction coefficients for open circuit and short circuit lines.	10M	4	L2
19	Derive the sag expression for a transmission line at equal level supports.	10M	5	L2
	OR			
20	Develop the mathematical expression for potential distribution over a string of suspension type insulators.	10M	5	L2