



R22 Regulation

Subject code: 4E4BE

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Regular Examinations, July 2024

POWER SYSTEM – II
(ELECTRICAL AND ELECTRONICS ENGINEERING)

Maximum Marks: 60

Date:27.07.2024 Duration: 3 hours

- Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 10 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		CO	Bloom Tx
All the following questions carry equal marks (10x1M=10 Marks)			
1.a)	Give the formulae for transmission parameters of long lines.	CO1	BL2
b)	What is Corona phenomena?	CO1	BL2
c)	List the harmful effects of low power factor.	CO2	BL1
d)	Give comparison between uncompensated and compensated lines.	CO2	BL2
e)	Mention the advantages of per unit system representation of system.	CO3	BL1
f)	What do you mean by the terms reflection coefficient and refraction coefficient?	CO3	BL1
g)	State the principle of Expulsion type lightning arrester.	CO4	BL1
h)	What is the surge absorber?	CO4	BL1
i)	Define zero sequence.	CO5	BL1
j)	Draw the sequence network connection of line-to-line fault.	CO5	BL2
Part-B			Bloom Tx level
Answer All the following questions. (5X10M=50Marks)			
2	A. Explain clearly the long line with a neat diagram. (5) B. A 3-phase 50 Hz transmission line has resistance, inductance and capacitance per phase of 10 ohms, 0.1 H and 0.9 μ F respectively and delivers a load of 35 MW at 132 kV and 0.8 p.f. lag. Determine the efficiency and regulation of the using (i) nominal-T (ii) nominal- π . (5)	CO1	BL3
OR			
3	Discuss the factors affecting the Corona loss. (10)	CO1	BL4
4	A. Describe the principle of on-load tap changing transformer? List out its merits and demerits. (5) B. A 3-phase line has an impedance of $(20 + j60)$ ohm per phase. The sending end voltage is 142 kV while the receiving end voltage is maintained at 132 kV for all loads by an automatic phase modifier. If the Kv Ar of the modifier has the same value for zero load as for a load of 50 MW, determine the rating of the modifier and p.f. of this load. (5)	CO2	BL4

	OR		
5	Describe clearly about the compensation of lines and discuss the different methods of compensation. (10)	CO2	BL3
6	A. Derive travelling waves. (5) B. State the advantages of per unit system. (5)	CO3	BL3
	OR		
7	A. Explain the concepts of incident, reflected and refracted waves in the transmission lines. (5) B. Discuss the behavior of a travelling wave when it reaches the end of: (i) Open circuited (ii) short circuited transmission line. Draw diagram to show voltage and current on the line before and after the wave reaches the end. (5)	CO3	BL3
8	A. Briefly discuss about various causes of over-voltages in the power system network. (5) B. Explain the various methods of transmission line protection against over voltage due to lighting strokes. (5)	CO4	BL3
	OR		
9	A. Explain the construction, principle of operation and applications of valve type lightning arrester with diagram. (5) B. What are ground rods and counterpoises? Discuss clearly how these can be used to improve the grounding conditions. Give various arrangements of counterpoise. (5)	CO4	BL3
10	A. Obtain the symmetrical components of the following set of unbalanced currents $I_a = 1.6\angle 250^\circ$, $I_b = 1.0\angle 180^\circ$ and $I_c = 0.9\angle 132^\circ$. Also find out the neutral current. (5) B. Derive an expression for the fault current for a double line to ground fault as an unloaded generator and draw its equivalent circuit. (5)	CO5	BL4
	OR		
11	Discuss the significance of positive, negative, zero sequence components with neat diagram. (10)	CO5	BL2