R22 Regulation *Subject code:4E3BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, June 2026

POWER SYSTEM-I

(EEE)

Maximum Marks: 60 Date:11.06.2026 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

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a)	What is a fuel cell?	1M	1	1
b)	What are the disadvantages of solar energy?	1M	1	1
c)	Give an example of a peak-load power plant.	1M	2	1
d)	Define the load factor of a plant.	1M	2	1
e)	Will the capacitance of a transmission line depend upon the ground effect?	1M	3	1
f)	What is a strain insulator, and where is it used?	1M	3	1
g)	What is a substation?	1M	4	1
h)	State the advantages of GIS.	1M	4	1
i)	In a 3-phase, 4-wire a.c balanced distribution system, the value of the current carried by a neutral conductor?	1M	5	1
j)	What is the main advantage of the ring main distributor?	1M	5	1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Draw a neat schematic diagram of a hydroelectric plant and explain the functions of various components.	10M	1	3
	OR			
3	Explain the function of the following in a nuclear power station: (i) control rods, (ii) reflectors, and (iii) coolants	10M	1	3
4	Explain how load curves help in the selection of the size and number of generating units.	4M	2	3
	Describe the important types of tariffs commonly used.	6M	2	3
	OR			
5	A generating station has the following daily load cycle:	10M	2	4

Time (Hours)	0—6	6—10	10—12	12—16	16—20	20—24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find (i) maximum demand, (ii) units generated per day, (iii) average load, and (iv) load factor

6	The three conductors of a 3-phase line are arranged at the corners of a triangle of sides 4, 5 and 6 meters. Calculate the inductance per km of each conductor when conductors are regularly transposed. The diameter of each line conductor is 5 cm.	10M	3	3
	OR			
7	Explain the different types of Insulators used in transmission lines.	10M	3	3
8	Draw the line diagram of a typical 33/11 kV sub-station. Explain the function of each equipment.	10M	4	4
	OR			
9	Explain the following: (i) single busbar system (ii) Single busbar system with sectionalisation	10M	4	3
10	State and explain different types of distribution systems.	10M	5	3
	OR			
11	A single-phase distributor 2 km long supplies a load of 120A at 0.8 p.f lagging at its far end and a load of 80A at 0.9 p.f lagging at its midpoint. Both power factors are referred to the voltage at the far end, the resistance and reactance per km (go and return) are 0.05Ω and 0.1Ω, respectively. If the voltage at the far end is maintained at 220 V, calculate: (i) voltage at the sending end and (ii) phase angle between the voltages at the two ends	10M	5	4