R25 Regulation *Subject code:5ES1AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Regular Examinations, January 2026

ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(CE)

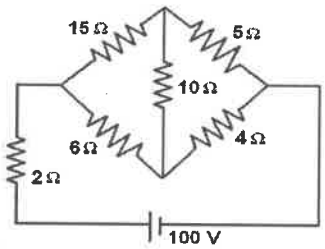
Maximum Marks: 60 Date:23.01.2026 Duration: 3 hours

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 (5X2M=10Marks)		Marks	CO	BTL
1.a	Define passive and active elements with examples.	2M	1	L2
b	Differentiate between MCB and MCCB based on current rating and application	2M	2	L2
c	State the EMF equation of a DC generator and mention the significance of each term.	2M	3	L2
d	What is a Zener diode? Mention any two applications of a Zener diode	2M	4	L1
e	List any two differences between BJT and FET.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) State and explain Kirchhoff's laws b) Find the current through 10 Ω resistor using Kirchhoff's laws (Fig.)  Figure 2	5M 5M	1	L4
	OR			
3	Derive the average value, form factor, peak factor and rms value of sinusoidal quantity.	10M	1	L2
4	a) Draw and explain the structure of a Switch Fuse Unit. b) Explain construction of MCB.	5M 5M	2	L2
	OR			

5	a) Explain the working principle of ELCB and its importance in electrical safety. b) List types of wires and cables and explain any two.	5M 5M	2	L2 L2
6	a) Explain the working principle of a single-phase transformer and draw its equivalent circuit. b) Explain losses in transformer.	5M 5M	3	L2 L2
	OR			
7	a) Explain the different three-phase transformer connections and their applications. b) Derive the EMF equation of a DC generator.	5M 5M	3	L2 L2
8	a) Explain Zener diode characteristics and its use as a voltage regulator b) Draw and explain the circuit of a half-wave rectifier and calculate its ripple factor.	5M 5M	4	L3 L2
	OR			
9	a) Derive the diode current equation and explain the significance of each term b) Differentiate between ideal and practical diode characteristics.	6M 4M	4	L3 L2
10	a) Draw and explain the construction of a BJT b) Explain the working of a BJT in common-emitter configuration	4M 6M	5	L3 L2
	OR			
11	a) Compare CE, CB, and CC configurations in terms of input/output resistance and gain. b) Explain the principle of operation of a FET.	5M 5M	5	L2 L2