R25 Regulation *Subject code:5ES1AN*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, June 2026

BASIC ELECTRICAL ENGINEERING

(Common to CSE(DS) & IT)

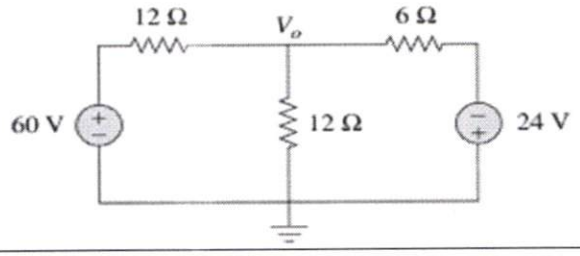
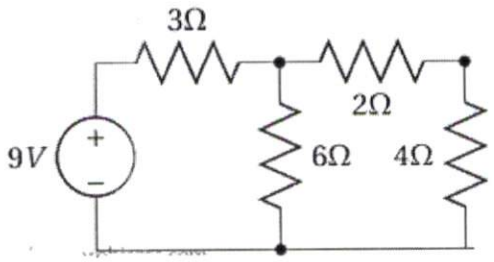
Maximum Marks: 60 Date:27.06.2026 Duration: 3 hours

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 (5X2M=10Marks)		Marks	CO	BTL
1.a	State maximum power transfer theorem.	2M	1	1
b	Define quality factor. How is it related to band width	2M	2	2
c	Enumerate the applications of transformers	2M	3	1
d	Why single-phase induction motor is not self-starting	2M	4	3
e	What is energy. Give its formula in terms of current	2M	5	2

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	a) State and explain Kirchhoff's laws. b) Find V_0 in the circuit shown below using nodal analysis. 	5M 5M	 1	2
	OR			
3	a) State and explain superposition theorem. b) Determine the current through 4Ω resistor using Norton's theorem. 	5M 5M	1	 2

4	a) Derive an expression for voltage and current of a series RL circuit. b) Define Formfactor. Prove that form factor of a sinusoidal waveform is 1.11.	5M 5M	2	2
	OR			
5	a) A series RLC circuit has R= 20Ω, L=100mH and C=50μF. Determine (i) Resonant frequency (ii) Q factor (iii) Band width b) Derive the relationship between phase and line quantities of voltage and current in a balanced delta connection.	5M 5M	2	2
6	a) Explain the working of transformer. b) A single-phase 2200/250 V, 50Hz transformer has a flux of 21.6mWb. Calculate the number of turns of primary and secondary.	5M 5M	3	2
	OR			
7	a) Discuss star-delta three phase transformer connection. b) Explain different losses in transformer.	5M 5M	3	2
8	Explain the construction and working principle of DC generator with neat diagrams.	10M	4	2
	OR			
9	a) Discuss the working principle of single-phase induction motor. b) Explain the working principle of synchronous generator.	5M 5M	4	2
10	a) What is earthing. Explain the need for earthing. Give the classification of earthing. b) What is switch fuse unit. Explain its working.	5M 5M	5	2
	OR			
11	a) What is battery. Give the classification and characteristics of batteries. b) What is the need for power factor improvement. Explain any one of the power factor improvement methods in details.	5M 5M	5	2