Regulation R22 *Subject code:4E1AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, September-2023

ELECTRICAL CIRCUITS

(EEE)

Maximum Marks: 60 Date:30.09.2023 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)

1.a State Ohm's Law.
b State KVL and KCL.
c Define Resonance and Resonant frequency.
d Define the term form factor, peak factor and Time period.
e Write the statement of Superposition theorem
f Write the statement of Thevenin's theorem
g Draw the Phasor diagram for AC through series RL circuit
h What is complex power
i Define self-Inductance
j Define connected and unconnected graph?

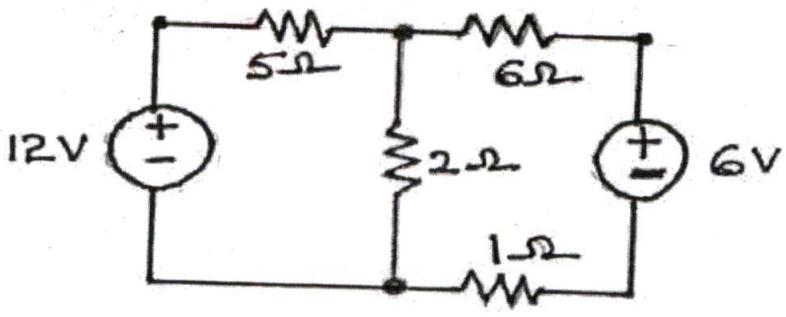
Part-B

Answer All the following questions. (5X10M=50Marks)

2 Derive the voltage, current, power and energy equations for Resistor, Inductor and Capacitor. 10M

OR

3 Determine the current through all resistors using mesh method for the network given below 10M



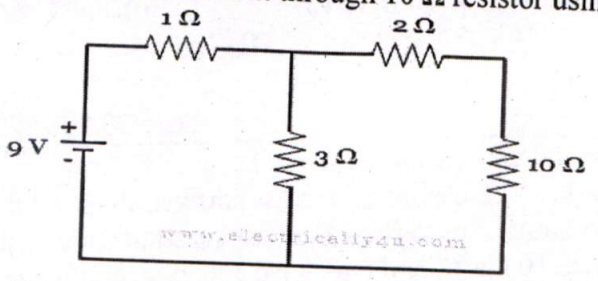
4 A voltage wave represented by V=200sin314t find 10M

i) Maximum value ii)Average value iii) RMS value iv) Frequency

OR

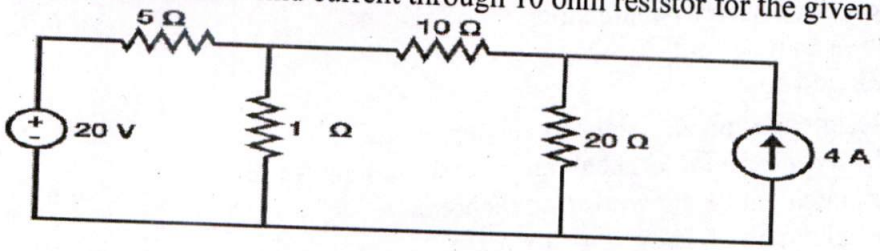
5 Define Apparent power, Active power and Reactive power and also draw the power triangle 10M

6 For the given circuit, determine the current through 10 Ω resistor using Norton's theorem 10M



OR

7 Using superposition Theorem find current through 10 ohm resistor for the given circuit. 10M

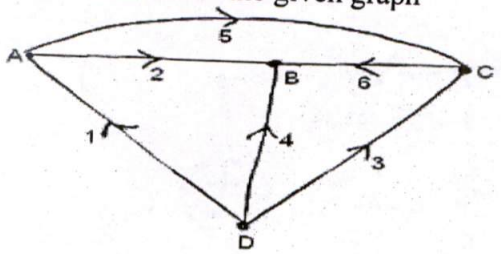


8 A three-phase balanced delta connected load of (10+j8) ohm is connected across a 400V, 3-ϕ balanced supply. Determine the phase currents and line currents. Assume phase sequence to be RYB.Also calculate the power drawn by the load. 10M

OR

9 Derive the relation between the line and phase quantities in star and delta connection system for a balanced star and delta connected load. 10M

10 Develop the fundamental tie-set matrix for the given graph 10M



OR

11 Derive an expression of self and Mutual inductance for the Magnetically Coupled circuits 10M