

Code: EE2T5

**I B.Tech - II Semester – Regular/Supplementary Examinations
April - 2019**

**ELECTRICAL CIRCUIT ANALYSIS - I
(ELECTRICAL & ELECTRONICS ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

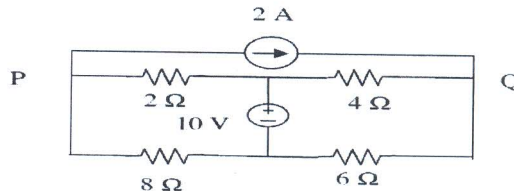
PART – A

Answer *all* the questions. All questions carry equal marks

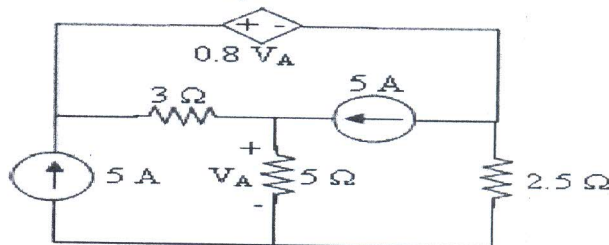
11 x 2 = 22 M

1.

- Define Kirchoff's Laws.
- Give the volt-ampere relations of R, L and C parameters.
- Apply nodal analysis for the following circuit. Write KCL equation at node Q.

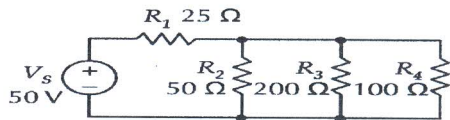


- Apply mesh analysis for the following circuit. Write KVL equations for three loops.



- Define average value and r.m.s value.

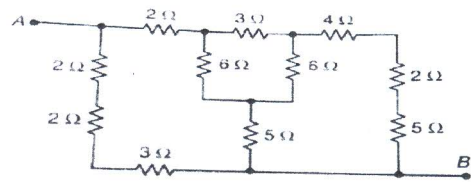
- f) Write the significance of operator j .
- g) Give formulae for resonant frequency, bandwidth and quality factor of series resonance.
- h) State reason for why three phase systems are preferred over single phase systems for the transmission of power.
- i) Determine the amplitude of the line current in a three phase voltage source of 300 V that supplies 1200 W to a delta connected load at a lagging PF of 0.8; then find the phase impedance.
- j) Express power factor in terms of wattmeter method.
- k) Apply source transformation to the following circuit to reduce it into single current source in parallel with the single resistance.



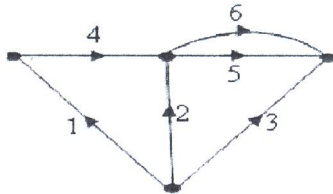
PART – B

Answer any **THREE** questions. All questions carry equal marks.
 3 x 16 = 48 M

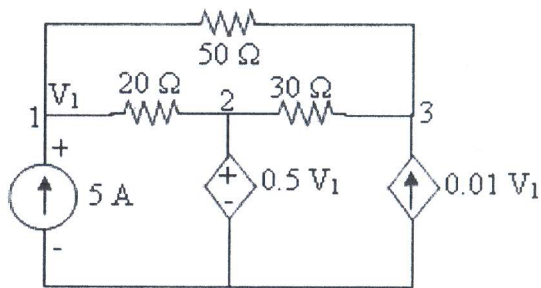
2. a) Calculate equivalent resistance between terminals A and B shown in circuit below. 8 M



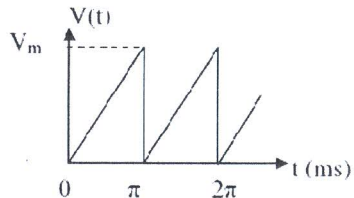
- b) Determine the basic cutset matrix for the oriented graph given in Figure below, where the branches 1, 2, 3 are tree branches. 8 M



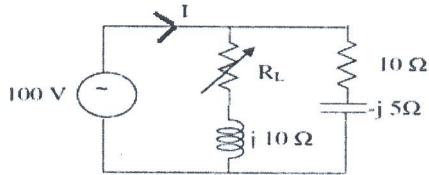
3. Determine node voltages using nodal analysis. 16 M



4. a) Find RMS and Average value of the following waveform. 8 M



- b) For the given circuit, draw the Locus diagram for the current drawn from the source. 8 M



5. a) Derive and explain the relationship between line voltage and phase voltage in the three phase balanced star connected system. 8 M
- b) A three phase three wire system has a balanced star connected load with a 50 Ohms resistance, 100 mH inductance in series with each line to the neutral point. The circuit is supplied with a balanced supply of 200V, 50 Hz. Determine the line current, total power and the power factor of the load. 8 M
6. a) Explain in detail about the star delta transformation technique of solving three phase unbalanced circuits. 8 M
- b) A three phase delta connected balanced supply 200V is connected to a star connected unbalanced load of impedances $(2+3j)$, $(4-6j)$ and $(2-5j)$. Find the line currents. 8 M