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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Regular Examinations May 2019
ELECTRICAL CIRCUITS-I
(Electrical and Electronics Engineering)

Time: 3 hours   Max. Marks: 60

PART-A
(Answer all the Questions **5 x 2 = 10** Marks)

1	a	State Ohm's law and write the limitations of Ohm's law.
	b	Define peak factor.
	c	State superposition theorem.
	d	Define Quality factor.
	e	Write the Faraday's laws of electromagnetic induction.

1 a State Ohm's law and write the limitations of Ohm's law.   2M
  b Define peak factor.   2M
  c State superposition theorem.   2M
  d Define Quality factor.   2M
  e Write the Faraday's laws of electromagnetic induction.   2M

PART-B
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2 a Determine the current in the 3Ω resistor in the network shown in figure.

5M
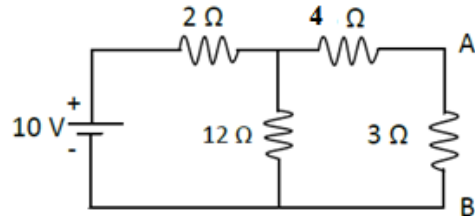
 b What are the types of sources? Explain them with suitable diagrams and characteristics.   5M

OR

3 a Derive an expression for total resistance when three resistances R_1, R_2 & R_3 are connected in series.   5M

  b Find the current through each resistor of the circuit shown in the figure using nodal analysis.


5M
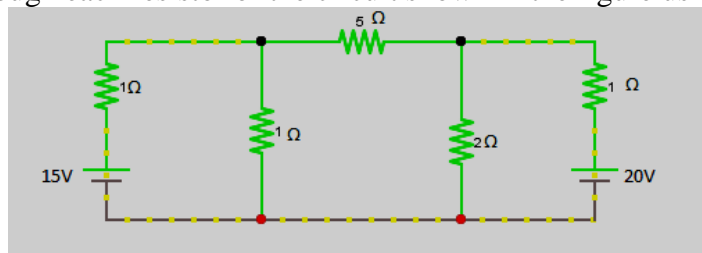
UNIT-II

4 a Find the form factor for the following wave form shown in figure.

5M
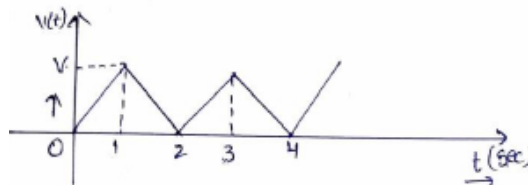
  b A pure inductive coil allows a current of 10A to flow from a 230V, 50Hz Ac supply. Find (a) Inductive Reactance (b) Inductance of the coil (c) Power absorbed (d) sinusoidal equations for voltage and current.   5M
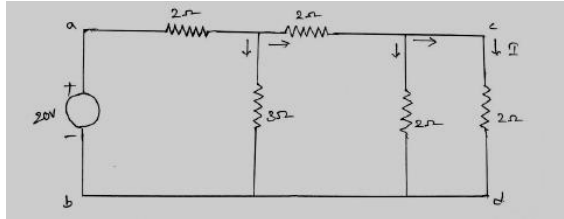
OR

5 a A Capacitor of 2μF is connected across an AC voltage of V=170 sin (400t).
Determine (a) Capacitive Reactance(b) Sinusoidal expression for current (c) Maximum current.   5M

  b Find the form factor for the following waveform shown in figure.
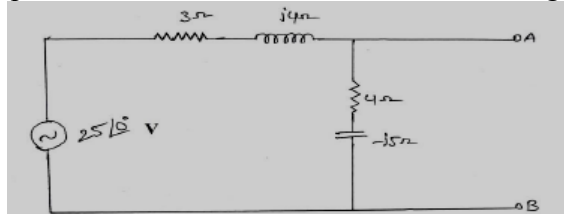

5M
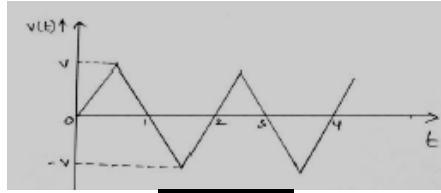
UNIT-III

6 a Verify reciprocity theorem for the network shown in figure.

5M

  b Derive the condition for the maximum power to be transferred from the source to the load.   5M

OR

7 a Determine the Norton's equivalent circuit for the circuit shown in figure.

5M

  b State and explain Millman's theorem.   5M

UNIT-IV

8 a In a parallel resonance circuit (Tank circuit) R=1Ω, L=1 mH and C=20μF, Find the Resonant Frequency, Dynamic impedance and bandwidth.   5M

  b Draw the locus diagram of a series RL circuit.   5M

OR

9 a Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit. 5M

  b Compare series resonance and parallel resonance.   5M

UNIT-V

10 a Compare electric and magnetic circuits and explain the analogy between the electric and magnetic circuits?   5M

  b Derive the expression for equivalent inductance when the coupled inductors are connected in parallel aiding and parallel resonance?   5M

OR

11 a Explain Self-inductance, Mutual inductance and Co-efficient of coupling in detail. Give the relation between L1, L2, K & M.   5M

  b A coil of 100 turns is wound uniformly over a insulator ring with a mean circumference of 1m and a uniform sectional area of 0.025cm^2.If the coil is carrying a current of 1A.
Calculate a)the mmf of the circuit (b)magnetic field intensity (c) flux density (d) total flux   5M

END