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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations May-2022
FUNDAMENTALS OF ELECTRICAL CIRCUITS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

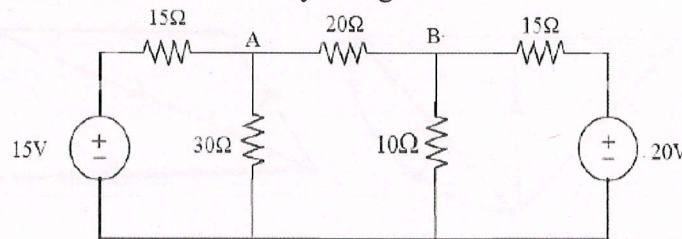
(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- | | | | |
|---|--|----|----|
| 1 | a Explain about Ideal and Practical Current sources in detail. | L1 | 4M |
| | b Explain the phasor relation for R, L & C elements. | L3 | 4M |
| | c Derive an expression for average values of sine wave form. | L4 | 4M |

OR

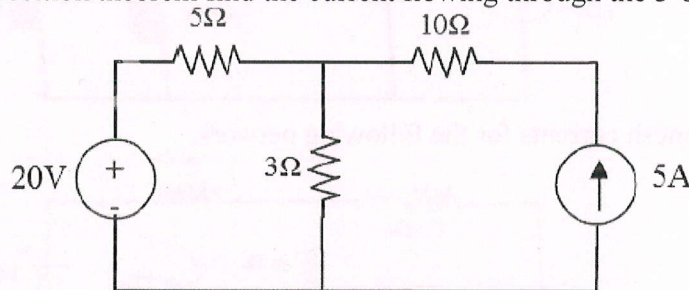
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|---|---|----|----|
| 2 | a Determine the current in branch A-B by using KVL. | L3 | 6M |
|---|---|----|----|



- | | | | |
|---|---|----|----|
| b | An alternating current is expressed as $I = 14.14 \sin 314t$. Determine.
(i) Maximum current (ii) RMS current (iii) Frequency
(iv) Instantaneous current when $t = 0.02$ msec. | L2 | 6M |
|---|---|----|----|

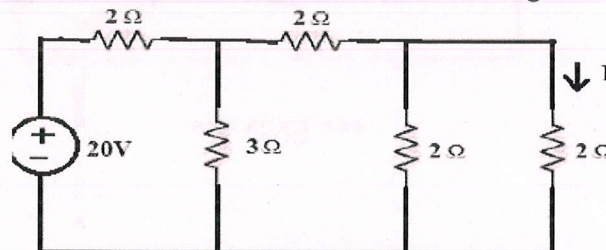
UNIT-II

- | | | | |
|---|--|----|----|
| 3 | a State & Explain Superposition Theorem? | L1 | 6M |
| | b By using superposition theorem find the current flowing through the 3-ohm resistor . | L4 | 6M |



OR

- | | | | |
|---|---|----|----|
| 4 | a State & Explain Norton's Theorem. | L1 | 4M |
| | b Verify reciprocity theorem for the network shown in below figure. | L4 | 8M |



UNIT-III

- | | | | |
|---|---|----|----|
| 5 | a Explain resonance for series RLC circuit and derive the equation for resonant frequency. | L3 | 6M |
| | b Determine the variation of impedance and phase angle of series resonant circuit with frequency. | L2 | 6M |

OR

- 6 a Explain resonance for parallel RLC circuit for a tank and derive the equation for resonant frequency. L3 6M
- b Explain about Band-width of parallel resonance. L3 6M

UNIT-IV

- 7 a Derive the expressions for mutual inductance with expressions. L2 6M
- b What are single and double tuned circuits? Where the tuned coupled circuits are Employed. L1 6M

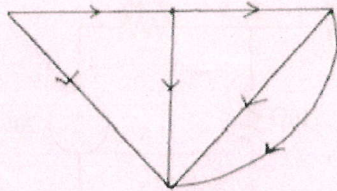
OR

- 8 a Explain series connection of coupled inductors. L3 6M
- b An ideal transformer is rated at 2400/120 V, 9.6 kVA, and has 50 turns on the secondary side. Calculate: (i) the turns ratio, (ii) the number of turns on the primary side, and (iii) the current ratings for the primary and secondary windings. L4 6M

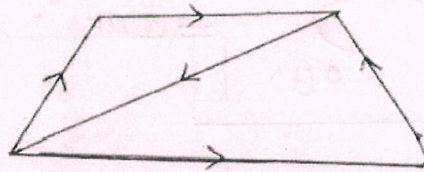
UNIT-V

- 9 a Find the tie-set matrix for the followings. L4 6M

a)



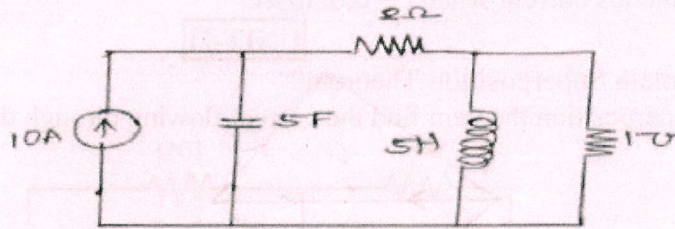
b)



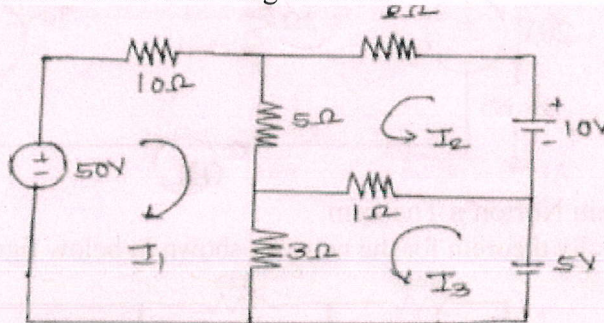
- b Write the procedure for constructing tie-set matrix. L2 6M

OR

- 10 a Write the procedure to draw the dual network and find dual network for the following. L4 6M



- b Determine mesh currents for the following network. L4 6M



*** END ***