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

B.Tech I Year II Semester Regular Examinations November-2021
FUNDAMENTALS OF ELECTRICAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 60

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

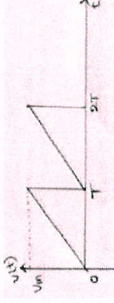
UNIT-I

- 1 a Explain in detail about passive elements?
- b State and prove Kirchoff's laws with suitable examples?
- c State and explain Ohm's law?

L2 4M
L3 4M
L3 4M

OR

- 2 a Find the RMS value for the following waveform?



- b Define power factor, apparent power, active power and reactive power?

L2 6M

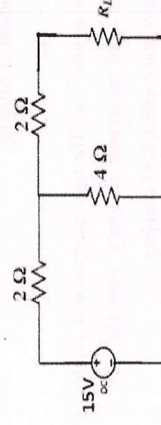
UNIT-II

- 3 a State & Explain Maximum Power Transfer Theorem?

L1 6M

- b Find load current by using Thevenin's theorem for the following circuit where $R_L = 3\Omega$

L3 6M



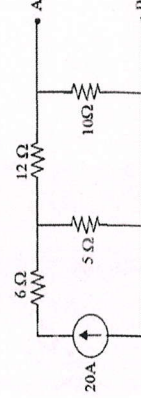
OR

- 4 a State & Explain Millman's Theorem?

L3 4M

- b Find the Norton's equivalent for the circuit shown below.

L3 8M



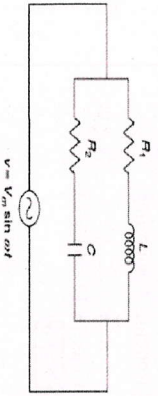
UNIT-III

R20

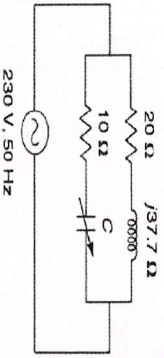
- 5 a Explain about Series resonance with phasor diagrams? L2 6M
 b Determine the quality factor of coil for the series circuit consisting of $R=10\Omega$, $L=0.1H$ and $C=10\mu F$ L4 6M

OR

- 6 a Derive the expression of resonant Frequency of the following circuit. L4 6M



- b Find the value of C in the circuit shown to get resonance. L4 6M



UNIT-IV

- 7 a What is the maximum possible mutual inductance of two inductively coupled coils with self-inductance of 50mH and 200mH? L2 6M
 b Two coupled coils have a self-inductances 37.5 mH and 193 mH, with the mutual inductance of 63.75mH. Find the co efficient of coupling. L3 6M

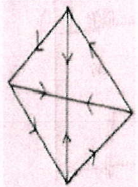
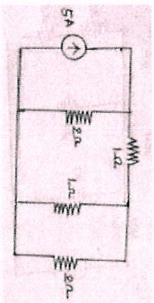
OR

- 8 a A 15mH coil is connected in series with another coil. The total inductance is 70mH. When one of the coils is reversed, the total inductance is 30mH. Find the self-inductance of second coil, mutual inductance and coefficient of coupling. L4 6M
 b What is ideal transformer and draw its phasor diagram L4 6M

UNIT-V

R20

- 9 a Find the cut-set matrix for the followings? L3 6M
 a) L4 6M



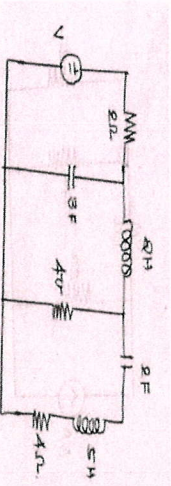
- b i) Define graph.

- ii) Define planar and non-planar graph.

- iii) Define duality.

OR

- 10 a Explain the relationship between branch current matrix and loop current matrix L4 6M
 b Write the procedure to draw the dual network and find dual network for the following L4 6M



*** END ***