

Reg. No: 

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SIDDHARTH INSTITUTE OF ENGINEERING &amp; TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Regular Examinations February-2022

ELECTRICAL CIRCUITS - 1

(Electrical and Electronics Engineering)

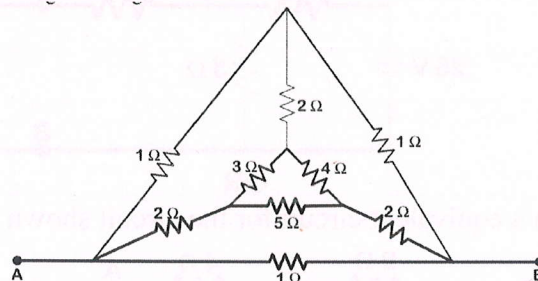
Time: 3 hours

Max. Marks: 60

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

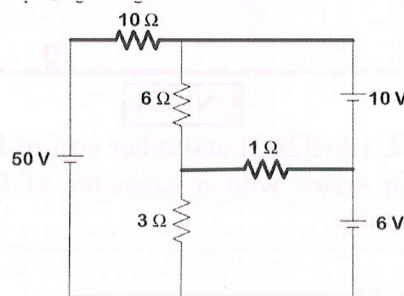
**UNIT-I**

- 1 Find the equivalent resistance across the terminals A and B of the network shown below using Star-delta transformation. **12M**



OR

- 2 Find the current passing through each resistor for the circuit shown below. **12M**

**UNIT-II**

- 3 a Derive the expression for equivalent inductance when the coupled inductors are connected in series aiding and series opposition. **6M**  
 b Write the Comparison of Electric and Magnetic circuits? Also explain the analogy between the Electric and Magnetic circuits. **6M**

OR

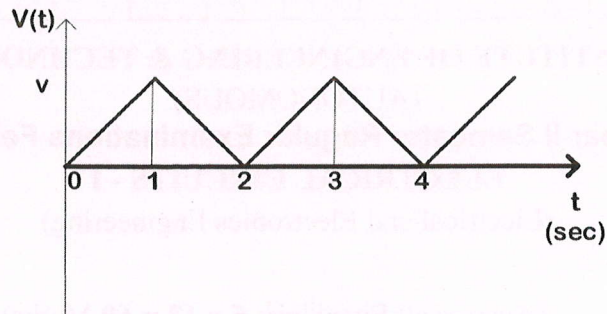
- 4 a Derive the expression for equivalent inductance when the coupled inductors are connected in parallel aiding and parallel opposition. **8M**  
 b Explain **4M**  
 (i) Faradays laws of electromagnetic induction  
 (ii) Relative permeability and coupling coefficient

**UNIT-III**

- 5 A  $1k\Omega$  resistor is connected in series with an inductance of  $50mH$  across a  $230V$ ,  $50Hz$  AC Supply. Find, **12M**  
 (i) Inductive reactance  
 (ii) Impedance  
 (iii) Current  
 (iv) Phase angle  
 (v) Voltage drop across resistance  
 (f) Voltage drop across Inductance

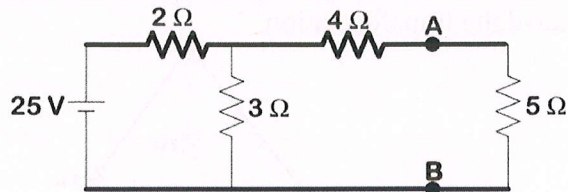
OR

- 6 Find the form factor for the following waveform shown in Figure. 12M



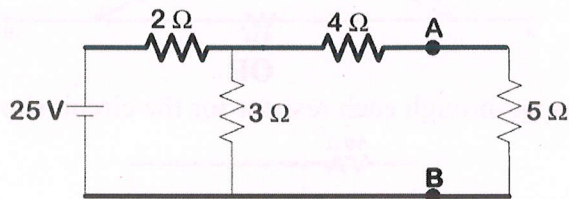
## UNIT-IV

- 7 Determine the Norton's equivalent circuit for the circuit shown in Figure. 12M



OR

- 8 Determine the Norton's equivalent circuit for the circuit shown in Figure. 12M



## UNIT-V

- 9 Two coils one of  $R_1=0.51\Omega$ ,  $L_1=32\text{mH}$  and other coil of  $R_2=1.3\Omega$ ,  $L_2=15\text{mH}$  are in series and are connected in series with a capacitor of  $C_1=25\mu\text{F}$ ,  $C_2=62\mu\text{F}$  and a resistor of  $R_3=0.24\Omega$ . Determine, 12M
- Resonant frequency
  - Quality factor of the circuit
  - Bandwidth
  - Power dissipated in the circuit at resonance frequency if the supply is 230V AC Supply.

OR

- 10 a Write the comparison between series resonance and parallel resonance. 6M  
 b Draw the Locus diagram of a Series RC Circuit. 6M

\*\*\* END \*\*\*