

Reg. No: 

--	--	--	--	--	--	--	--	--	--

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

**B.Tech I Year II Semester Supplementary Examinations July-2021**

**ELECTRICAL CIRCUITS - 1**

(Electrical and Electronics Engineering)

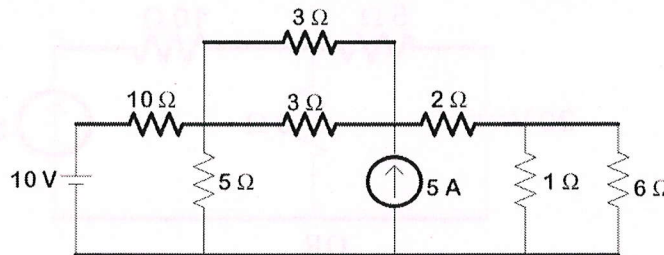
Time: 3 hours

Max. Marks: 60

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

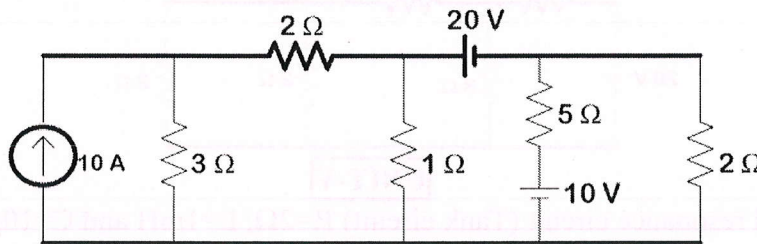
**UNIT-I**

- 1 Determine the voltages at each node for the circuit shown below. 12M



OR

- 2 Determine the current in the 5Ω resistor in the network given below. 12M



**UNIT-II**

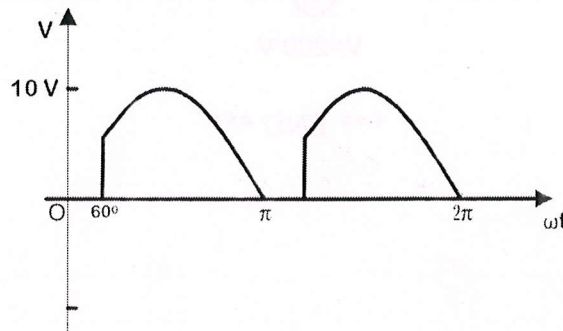
- 3 a Discuss about Ideal transformer. 6M  
b Derive an expression for energy stored in an inductor. 6M

OR

- 4 When two identical coupled coils are connected in series, the inductance of the combination is found to be 80 mH. When the connections to one of the coils are reversed, a similar measurement indicates 20 mH. Find the coupling coefficient between the coils. 12M

**UNIT-III**

- 5 The full wave rectified sine wave shown in Figure has a delay angle of 60°. Calculate the average value and RMS value. 12M

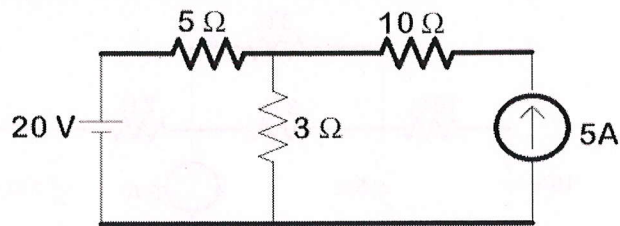


OR

- 6 A  $50\Omega$  resistor is connected in series with a  $25\mu\text{F}$  Capacitor across a  $230\text{V}$ ,  $50\text{Hz}$  AC Supply. Find 12M
  - (a) Capacitive reactance
  - (b) Impedance
  - (c) Current
  - (d) Phase angle
  - (e) Voltage drop across resistance
  - (f) Voltage drop across Capacitance
  - (g) Power Factor.

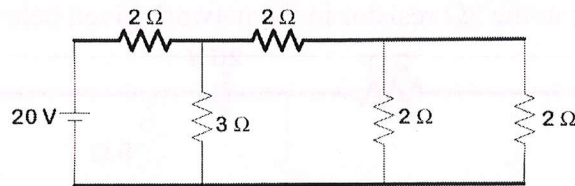
**UNIT-IV**

- 7 Find the current passing through  $3\Omega$  Resistor for the circuit shown below in Figure 12M by using Superposition theorem.



OR

- 8 Verify Reciprocity Theorem for the network shown in Figure. 12M

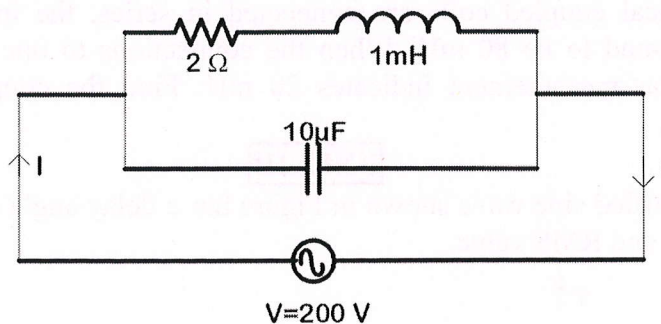


**UNIT-V**

- 9 a In a parallel resonance circuit (Tank circuit)  $R=2\Omega$ ,  $L=1\text{mH}$  and  $C=10\mu$ . Find the Resonant frequency, Dynamic impedance and Bandwidth. 6M  
b Obtain the expression for resonant frequency for parallel RL-RC circuit. 6M

OR

- 10 In a parallel Resonant circuit shown in Figure, find the Resonant frequency, Dynamic impedance, Bandwidth, Q-factor and Current at resonance. 12M



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