Q.P. Code: 19EE0201 **R19**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B Tech I Year II Semester Regular Examinations October-2020

Electrical Circuits - I

(Electrical & Electronics Engineering)

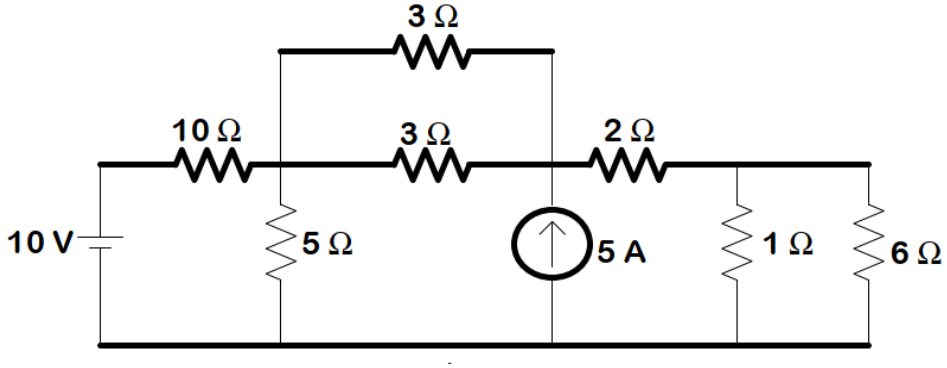
Time: 3 hours Max. Marks: 60

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

UNIT-I

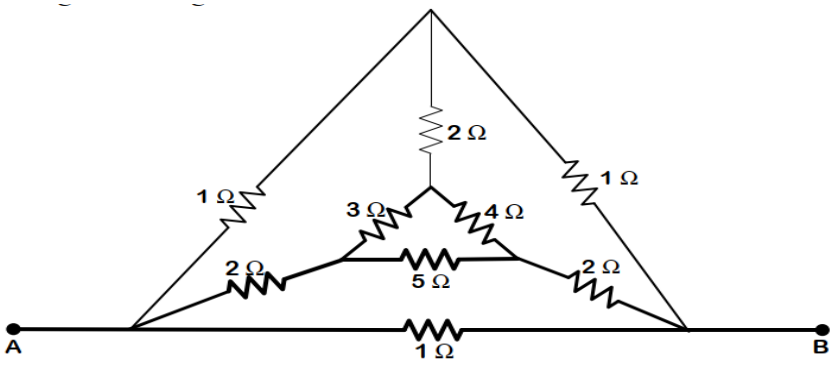
1 **a** Derive the equivalent resistances when two resistances are connected in series. **3M**

b Determine the voltages at each node for the circuit shown in Figure. **9M**



OR

2 **a** Find the equivalent resistance across the terminals A and B of the network shown in Figure. using Star-delta transformation **9M**



b Write a formula for Star to Delta transformation with necessary diagram **3M**

UNIT-II

3 **a** Define Relative permeability and coupling coefficient **3M**

b Explain Self Inductance, Mutual Inductance and Co-efficient of coupling in detail. Give the relation between L1, L2, k and M. **9M**

OR

4 **a** 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.. **9M**

b State the transformer working principle. **3M**

UNIT-III

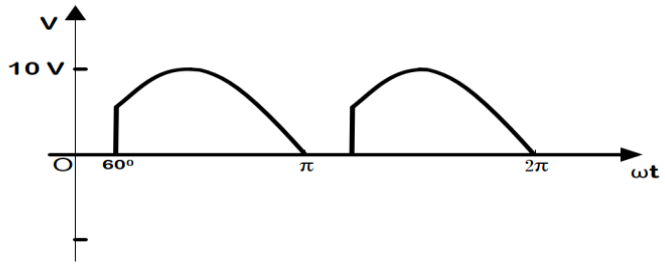
5 **a** A Capacitor of 1μF is connected across an AC Voltage of V=170 sin (400t). Determine, **8M**
(i) Capacitive Reactance
(ii) Sinusoidal expression for current
(iii) Maximum current.

b Define Root Mean Square value. **4M**

OR

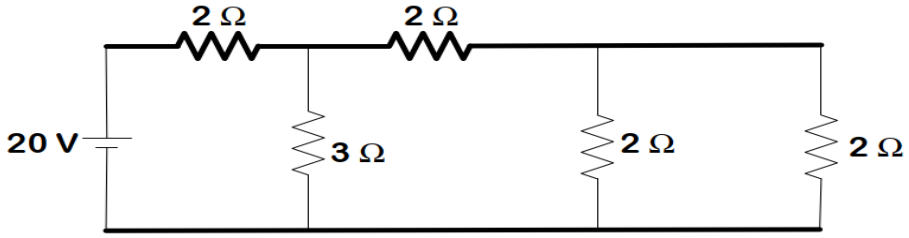
6 **a** Draw phasor diagram for simple RC series circuit. **4M**

b The full wave rectified sine wave shown in Figure has a delay angle of 60deg. Calculate the average value and RMS value. **8M**



UNIT-IV

7 **a** Verify Reciprocity Theorem for the network shown in Figure. **9M**

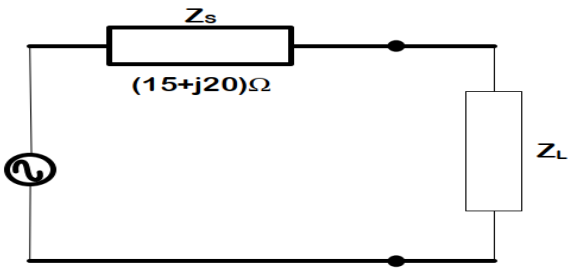


b State Milliman's Theorem. **3M**

OR

8 **a** State Tellegen's theorem. **3M**

b For the circuit shown in Figure, find the value of load impedance for which the source delivers maximum power. Also calculate the value of maximum power. **9M**



UNIT-V

9 **a** Obtain the expression for resonant frequency for parallel RL-RC circuit. **6M**

b In a parallel resonance circuit (Tank circuit) R=2Ω, L=1mH and C=10μ. Find the Resonant frequency, Dynamic impedance and Bandwidth. **6M**

OR

10 **a** Derive and draw the Locus diagram of a Series RC Circuit. **9M**

b Define Bandwidth and quality factor. **3M**

*** END ***