

Reg. No:

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

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

B.Tech I Year II Semester Supplementary Examinations October-2020

ELECTRICAL CIRCUITS - I

(Electrical & Electronics Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

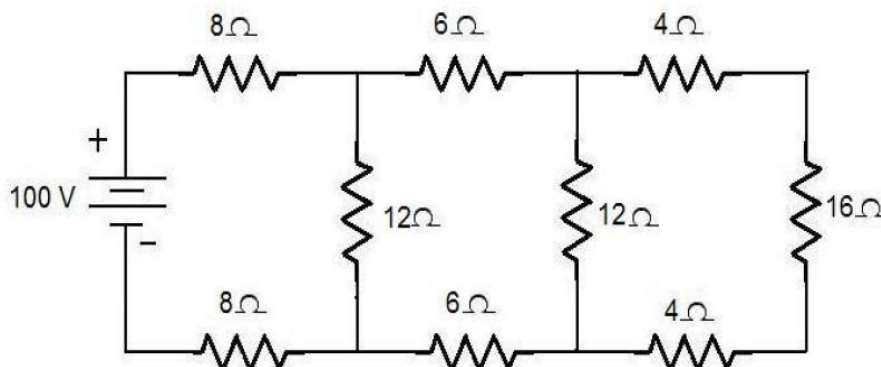
- 1 a Define the following: (i) Power (ii) Energy 2M
- b Define power factor. What is its importance in a.c circuits? 2M
- c Write some applications of Maximum power transfer theorem. 2M
- d What is mean by Resonant Frequency? 2M
- e Explain the importance of Dot Convention in Magnetic Coupled Circuits. 2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 Calculate (i) the equivalent resistances across the terminals of the supply, (ii) total current supplied by the source and (iii) power delivered to 16-ohm resistor in the circuit shown in figure. 10M

**OR**

- 3 Derive the expression for Delta connected resistances in terms of Star connected resistances. 10M

UNIT-II

- 4 Determine the average value, RMS value, Form factor and peak factor of a pure sinusoidal Waveform. 10M

OR

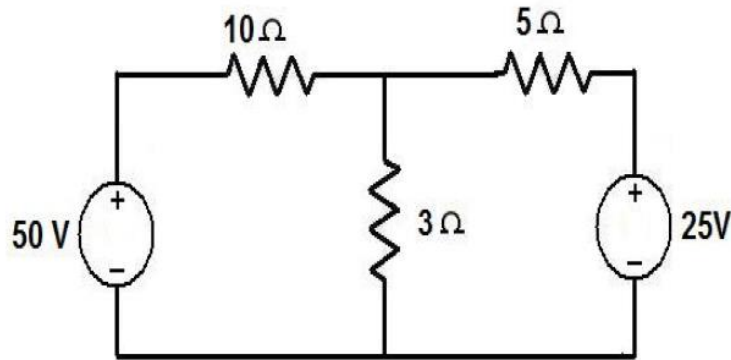
- 5 A Pure Inductive coil allows a current of 10A to flow from a 230V, 50HZ AC Supply. **10M**
Find (i) Inductive Reactance (ii) Inductance of the coil (ii) Power Absorbed (iv) Sinusoidal equations for Voltage and Current.

UNIT-III

- 6 a State and prove Norton's theorem. **5M**
b State and explain reciprocity theorem. **5M**

OR

- 7 a Write Statement and Limitations of Superposition Theorem. **4M**
b For the circuit shown below, use superposition theorem to compute current in each resistor. **6M**

**UNIT-IV**

- 8 a Obtain the expression for resonant frequency for parallel RL-RC circuit **5M**
b In a parallel resonance circuit (Tank circuit) $R=2\Omega$, $L=1\text{mH}$ and $C=10\mu\text{F}$, Find the **5M**
Resonant frequency, Dynamic impedance and Bandwidth.

OR

- 9 Draw the Locus diagram of a Series RC Circuit. **10M**

UNIT-V

- 10 Write the Comparison of Electric and Magnetic circuits. Also, explain the analogy **10M**
between the Electric and Magnetic circuits.

OR

- 11 a State and explain Faraday's Laws of Electro Magnetic Induction. **6M**
b Two inductively coupled coils have self - inductances $L_1 = 50\text{mH}$ and $L_2 = 200\text{mH}$. If the coefficient of coupling is 0.5 (i) find the value of mutual inductance **4M**
between the coils, and (ii) what is the maximum possible mutual inductance.

END