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

B.Tech I Year I Semester Regular & Supplementary Examinations May-2022

PRINCIPLES OF ELECTRICAL CIRCUITS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

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

UNIT-I

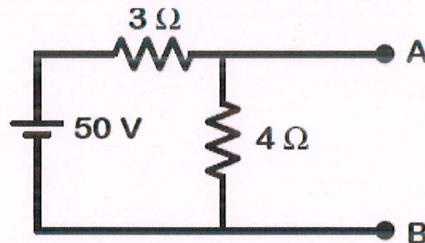
- 1 a State and explain Ohm's law with limitations. L2 6M
 b Three resistances of values 20Ω , 30Ω and 50Ω are connected in series across L3 6M
 20 V DC supply. Calculate,
 i) Equivalent resistance of the circuit.
 ii) Total current from the supply.
 iii) Voltage drop across each resistor.
 iv) Power dissipated in each resistor.

OR

- 2 a Explain nodal analysis by taking one example. L2 6M
 b Explain in detail about star to delta transformation of a resistive network. L3 6M

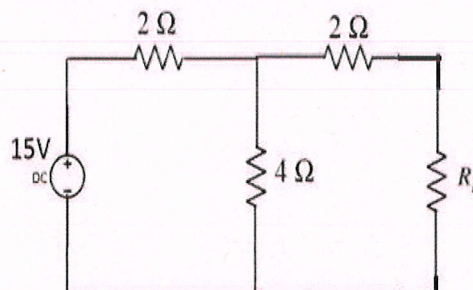
UNIT-II

- 3 a State & explain Super position theorem. L1 6M
 b Find Norton's equivalent circuit across AB for the circuit shown. L3 6M



OR

- 4 a State and prove maximum power transfer theorem. L3 6M
 b Find load current by using Thevenin's theorem for the following circuit L3 6M
 Where $R_L = 3\Omega$.



UNIT-III

- 5 a Derive the Transient Response of series RL-circuit with D.C excitation L2 6M
 b A series RL circuit with $R=30\Omega$ and $L=15\text{H}$ has a constant voltage $V=60\text{V}$ applied at $t=0$. Determine the current "I", voltage across resistor and voltage across inductor. L4 6M

OR

- 6 a The circuit consists of Resistance=20 Ohm, Inductance = 0.05H, Capacitance = 20uF in Series with a 100V Constant at $t=0$. Find the Current Transient. L2 6M
- b Derive the Laplace Transform of Series RC Circuit. L2 6M

UNIT-IV

- 7 a Define apparent power, active power and reactive power. L2 6M
- b Derive an expression for average values of sine wave form. L2 6M

OR

- 8 a A resistor of 50Ω and inductance of 100mH are connected in series across 200V, 50Hz supply. Determine the following (i) Impedance (ii) current flowing through the circuit (iii) power factor L2 6M
- b Explain the phasor relation for R, L & C elements L4 6M

UNIT-V

- 9 a Define Two port network and explain about Impedance parameters. L2 6M
- b Explain about short-circuit parameters. L2 6M

OR

- 10 a Define filters and explain classifications of filters. L2 6M
- b Design a Band-elimination filter having design impedance of 600Ω and cut-off frequencies $f = 2\text{kHz}$ and $f = 6\text{kHz}$. L2 6M

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