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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.Tech II Year II Semester Supplementary Examinations July-2022
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Mechanical Engineering)

Time: 3 hours

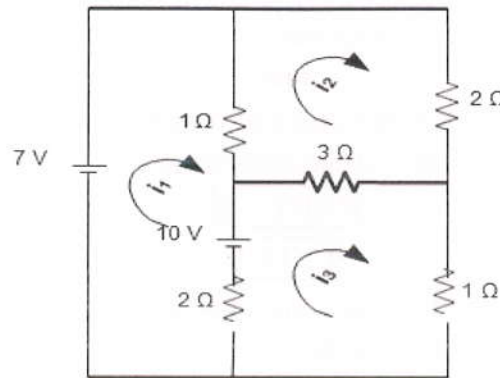
Max. Marks: 60

(Answer all Six Units 6 X 10 = 60 Marks)

PART- A

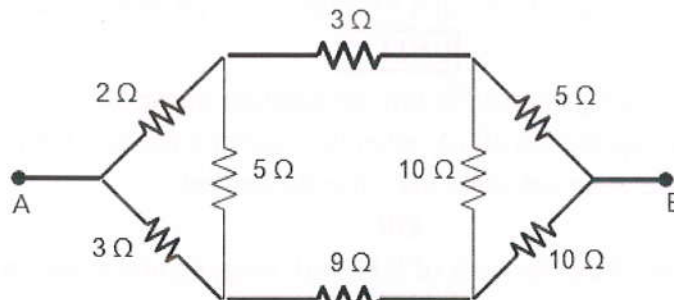
UNIT-I

- 1 a State and prove Kirchoff's laws with suitable examples. L3 5M
 b Find i_1, i_2, i_3 for the given circuit by using Kirchoff's laws. L3 5M



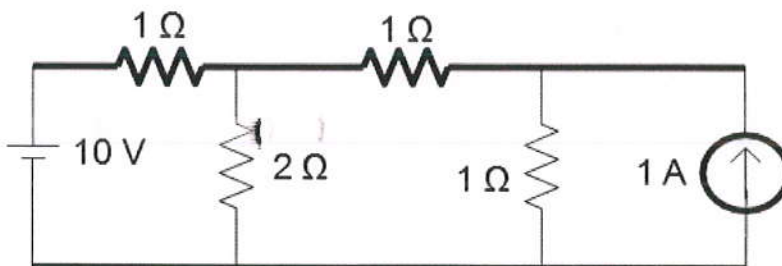
OR

- 2 Find the voltage to be applied across AB in order to drive a current of 5A into the circuit. L3 10M



UNIT-II

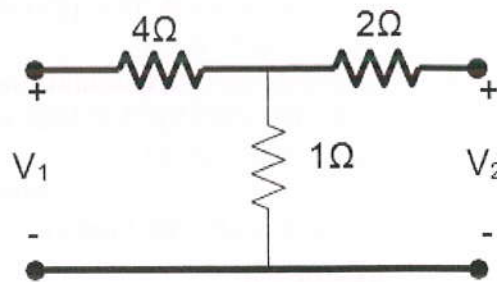
- 3 a State Super position theorem L1 2M
 b Calculate the current in 20Ω resistor in the given circuit using super position theorem. L3 8M



OR

- 4 Find the Short circuit parameters for the given circuit.

L4 10M



UNIT-III

- 5 a Derive Torque equation of dc motor. L2 5M
 b The counter emf of Shunt motor is 227 V. The field resistance is 160Ω and field current 1.5A. If the line current is 36.5A, find the armature resistance also find armature current when the motor is stationary. L3 5M

OR

- 6 a Derive the condition for maximum efficiency of the transformer. L2 5M
 b Discuss about the voltage regulation of the transformer. L2 5M

PART - B

UNIT-I

- 7 a What is Doping? Describe P-and N-type semiconductors? L2 5M
 b Explain the behavior of PN junction diode. L2 5M

OR

- 8 a With neat diagram, explain the working principle of Full Wave Rectifier. Draw its input and Output waveforms. L3 5M
 b Derive the expression for Ripple factor and Efficiency of Full Wave Rectifier. L2 5M

UNIT-II

- 9 a Describe in detail the working of an NPN bipolar junction transistor. L2 5M
 b If the base current in a transistor is $20\mu\text{A}$ when the emitter current is 6.4mA, what are the values of α and β ? Also calculate the collector current. L3 5M

OR

- 10 Describe the Voltage Divider Bias Network of BJT with diagram and equations. L2 10M

UNIT-III

- 11 a Explain the construction and principle of operation of N-channel JFET. L3 5M
 b Define the JFET Volt-Ampere Characteristics and determine FET parameters. L3 5M

OR

- 12 a Draw the construction of EMOSFET and explain its operation. L3 5M
 b Explain the operation DMOSFET. L3 5M

*** END ***