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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)

B.TECH II Year II Semester Supplementary Examinations March 2021

BASIC ELECTRICAL & 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. Discuss about various energy sources in detail. 5M
 b. Explain the following in detail 5M
 i) Resistive networks
 ii) Inductive networks

OR

- 2 Three resistances of values 20, 30 and 50 are connected in series across 20 V DC supply. 10M
 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.

UNIT-II

- 3 a. The given ABCD parameters are $A=2$, $B=0.9$, $C=1.2$, $D=0.5$. Find Y-parameters. 2M
 b. State and prove Reciprocity theorem with suitable example. 8M

OR

- 4 a. i) Define Thevenin's and Norton's theorem. 5M
 ii) State Maximum power theorem.
 b. i) Define Super position theorem. 5M
 ii) Mention the importance of two port networks.

UNIT-III

- 5 a. Explain about constructional details of dc motor. 5M
 b. Derive the condition for maximum efficiency of the transformer. 5M

OR

- 6 a. Discuss about the voltage regulation of the transformer. 5M
 A 20 kVA, 2000/200 V, 50 Hz transformer has 66 secondary turns. Calculate the 5M
 b. number of primary turns and primary and secondary currents. Neglect losses.

PART - B

UNIT-I

- 7 a. Discuss Zener Diode breakdown mechanism. Draw the Zener diode in its reverse bias and explain its Volt-Ampere characteristics. 5M
 b. Draw the atomic structure of a semiconductor and explain why an intrinsic semiconductor is relatively a poor conductor of electricity. 5M

OR

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

UNIT-II

- 9 a. Describe in detail the working of an NPN bipolar junction transistor? Why is it called Bipolar? **5M**
b. Compare the characteristics of BJT CB, CE and CC transistor configurations. **5M**

OR

- 10 a. A transistor operating in CB configuration has $I_C = 2.98\text{mA}$, $I_E = 3.00\text{mA}$ and $I_{CO} = 0.01\text{mA}$. What current will flow in the collector circuit for this transistor when connected in CE configuration with a base current of $30\mu\text{A}$? **5M**
b. With neat circuit diagram and equations, explain Fixed Bias circuit of BJT. **5M**

UNIT-III

- 11 a. Discuss the configuration of JFET. **5M**
b. Explain the CD configuration and draw its construction. **5M**

OR

- 12 a. Write the comparison BJT and JFET. **5M**
b. Explain the output characteristics of JFET. **5M**

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