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

B.Tech I Year I Semester Supplementary Examinations November-2022

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

(Mechanical Engineering)

Time: 3 hours

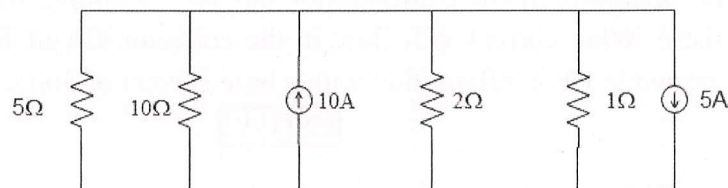
Max. Marks: 60

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

PART-A

UNIT-I

- | | | | | |
|---|---|--|----|----|
| 1 | a | State and explain Ohm's law. | L1 | 5M |
| | b | For the given circuit as shown in figure find the voltage across 10 ohm resistor and the current passing through it. | L1 | 5M |

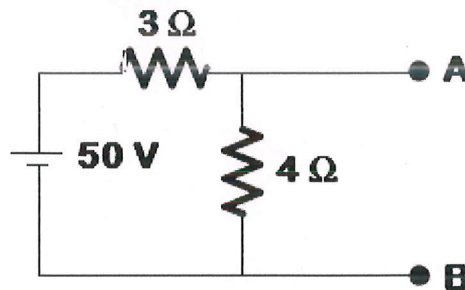


OR

- | | | | | | |
|---|---|--|--|----|-----|
| 2 | Derive the expression of Star-Delta transformation and Delta to star transformation | | | L4 | 10M |
|---|---|--|--|----|-----|

UNIT-II

- | | | | | |
|---|---|--|----|----|
| 3 | a | State Norton's theorem. | L1 | 2M |
| | b | Find Norton's equivalent circuit across AB for the circuit shown | L3 | 8M |



OR

- | | | | | | |
|---|--|--|--|----|-----|
| 4 | Explain the principle and operation of DC generator. | | | L2 | 10M |
|---|--|--|--|----|-----|

UNIT-III

- | | | | | |
|---|---|---|----|----|
| 5 | a | Derive Torque equation of dc motor. | L3 | 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. | L5 | 5M |

OR

- | | | | | |
|---|---|---|----|----|
| 6 | a | Explain constructional details of transformer. | L2 | 6M |
| | b | A 20 kVA, 2000/200V, 50Hz transformer has 66 secondary turns. Calculate the number of primary turns and primary and secondary currents. Neglect losses. | L4 | 4M |

PART-B**UNIT-IV**

- 7 **a** What is Doping? Describe P-and N-type semiconductors. **L1 5M**
 b Explain about diffusion current with expressions. **L2 5M**

OR

- 8 **a** Draw the circuit diagram of a full wave rectifier and explain its operation. **L1 5M**
 b Define 'Ripple Factor' and derive an expression for ripple factor of a full wave Rectifier. **L1 5M**

UNIT-V

- 9 Draw the circuit diagram of an CE configuration and describe its input and output characteristics. **L1 10M**

OR

- 10 **a** Give the relationship between α , β and γ of a Transistor. **L2 5M**
 b 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 $30\mu\text{A}$. **L1 5M**

UNIT-VI

- 11 **a** Classify the types of JFET and Draw its symbols. **L2 4M**
 b Describe the working principle of N-channel JFET. **L2 6M**

OR

- 12 With the help of neat diagram, explain the operation and characteristics of N-channel Depletion type MOSFET under Enhancement mode. **L2 10M**

***** END *****