Reg. No:

### SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)
**B.Tech II Year I Semester Supplementary Examinations August-2021**
**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**
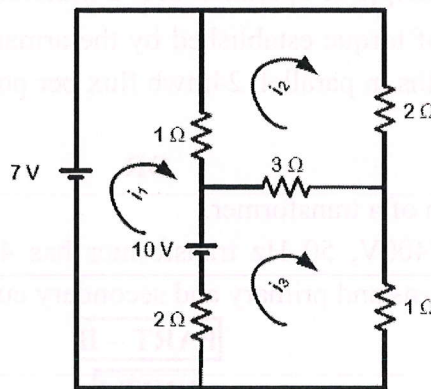(Mechanical Engineering)

Time: **3 hours**                                                                        Max. Marks: **60**
(Answer all Six Units 6 X 10 = 60 Marks)

### PART- A
### UNIT-I

**Q.1**  a   State and prove Kirchhoff's laws with suitable examples.                                **5M**
       b   Find $i_1$, $i_2$, $i_3$ for the given circuit by using Kirchhoff's laws?                 **5M**



**OR**

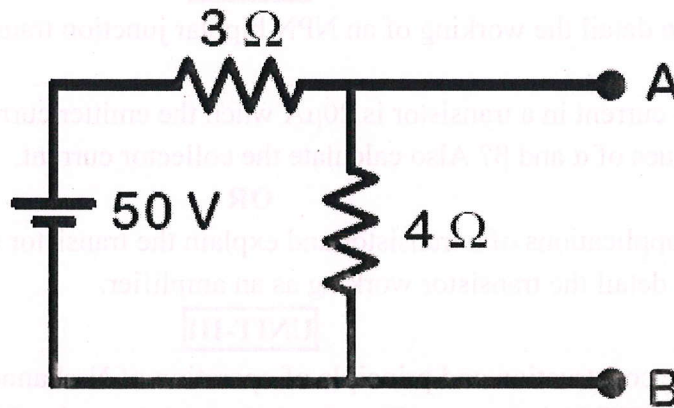**Q.2**  Explain in detail about                                                                   **10M**
       (i) RMS value, (ii) Average value, (iii) Form factor, (iv) Peak factor
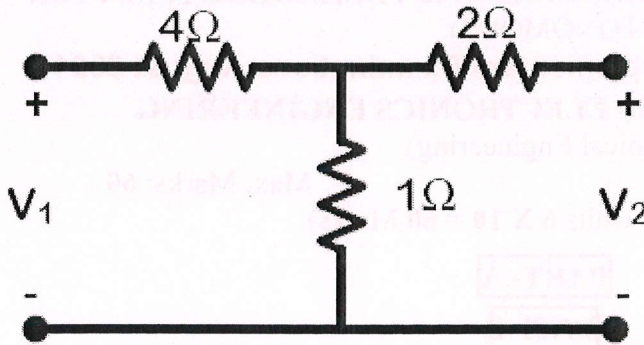       (v) Prove that the form factor of the sinusoidal wave is 1.11.

### UNIT-II

**Q.3**  a   State Norton's theorem.                                                              **2M**
       b   Find Norton's equivalent circuit across AB for the circuit shown.                      **8M**

**OR**

Q.4 Find the Open circuit parameters for the given circuit 10M



**UNIT-III**

Q.5 a Discuss about the principle of operation of DC motors. 5M

b Calculate the value of torque established by the armature of a 4-pole DC motor having 774 conductors, 2 paths in parallel, 24mwb flux per pole when the total armature current is 50A. 5M

**OR**

Q.6 a Derive EMF equation of a transformer. 5M

b A 100 kVA, 11000/400V, 50 Hz transformer has 40 secondary turns. Calculate the number of primary turns and primary and secondary currents. 5M

**PART – B**

**UNIT-I**

Q.7 a With neat diagram, explain the working principle of Full Wave Rectifier. Draw its input and output waveforms. 5M

b Derive the expression for Ripple factor and Efficiency of Full Wave Rectifier. 5M

**OR**

Q.8 a Discuss Zener Diode breakdown mechanism. 5M

b Draw the Zener diode in its reverse bias and explain its Volt-Ampere characteristics. 5M

**UNIT-II**

Q.9 a Describe in detail the working of an NPN bipolar junction transistor. Why is it called Bipolar? 5M

b If the base current in a transistor is 20μA when the emitter current is 6.4mA, what are the values of α and β? Also calculate the collector current. 5M

**OR**

Q.10 a Write the applications of a transistor and explain the transistor acts a switch. 5M

b Explain in detail the transistor working as an amplifier. 5M

**UNIT-III**

Q.11 a Explain the construction and principle of operation of N-channel JFET. 5M

b Define the JFET Volt-Ampere Characteristics and determine FET parameters. 5M

**OR**

Q.12 a Explain the static characteristics of MOSFET and draw its characteristics 5M

b Write the application of MOSFET 5M

*** END ***