Code No: 154AE **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, November/December - 2020
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE, ME, MMT, MIE)

Time: 2 hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

\- - -

1.a) Determine the voltage across the 10 kΩ resistor at terminals a-b of the circuit shown in Figure 1. All resistances are in ohms.

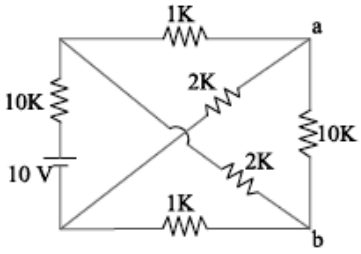

Figure: 1

b) Find the magnitude and direction of current I in the network of Figure 2. All resistances are in ohms. [7+8]

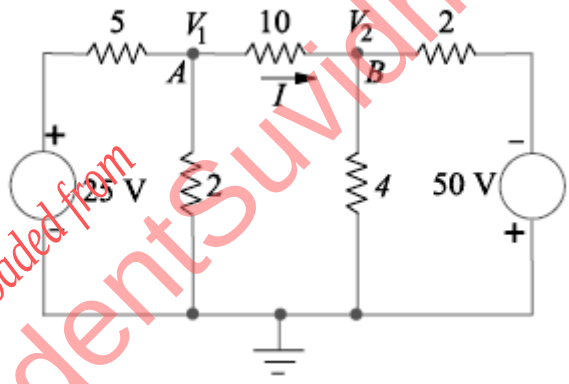

Figure: 2

2.a) Find the r.m.s. value of the resultant current in a wire which carries simultaneously a direct current of 10 A and a sinusoidal alternating current with a peak value of 10 A.

b) Deduce the relationship between the phase and line voltages of a three-phase star-connected alternator. If the phase voltage of a 3-phase star-connected alternator be 200 V, what will be the line voltages (i) when the phases are correctly connected and (ii) when the connections to one of the phases are reversed. [6+9]

3.a) What are the applications of ELCB? Explain the working principle of ELCB.

b) Describe the construction and the chemistry of working of a nickel-cadmium storage battery. [8+7]

4.a) What is the objective of earthing any electrical installation? Explain about any two types of earthing with diagrams.

b) Explain about the methods of power factor improvement in single phase and three phase star & delta connections. [8+7]

5.a) Describe how the speed of the dc motor can be controlled above and below its rated speed.

b) A dc generator has an armature e.m.f of 100 V when the useful flux per pole is 20 mWb and the speed is 800 r.p.m. Calculate the generated e.m.f (i) with the same rated flux and a speed of 1000 r.p.m (ii) with a flux per pole of 25 mWb and a speed of 900 r.p.m.[7+8]

6.a) Describe briefly torque-slip characteristics of induction motor. Based on these characteristics what are its applications?

b) Explain the various losses in a transformer. Describe how each loss varies with the load current, supply voltage and frequency. [8+7]

7.a) Explain the VI characteristics of PN Junction diode with neat diagrams and explain. What is Static Resistance and Dynamic Resistance?

b) Describe the NPN transistor operation in the common base configuration. What are its operating regions? [7+8]

8.a) Illustrate the input and output characteristics of BJT in three configurations.

b) Compare CE, CB and CC configurations of BJT. [7+8]

---ooOoo---