Code No: 154AE

R18

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech II Year II Semester Examinations, March - 2022
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE, ME, MMT, MIE)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks

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1.a) Obtain v_1, v_2 and v_3 in the circuit of Figure 1.

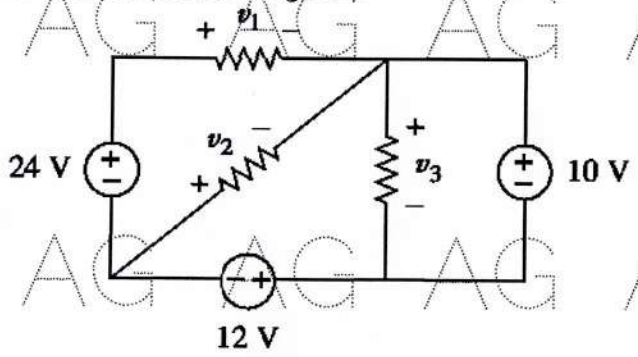

Figure: 1

b) For the circuit in Figure 2, obtain v_1 and v_2. [7+8]

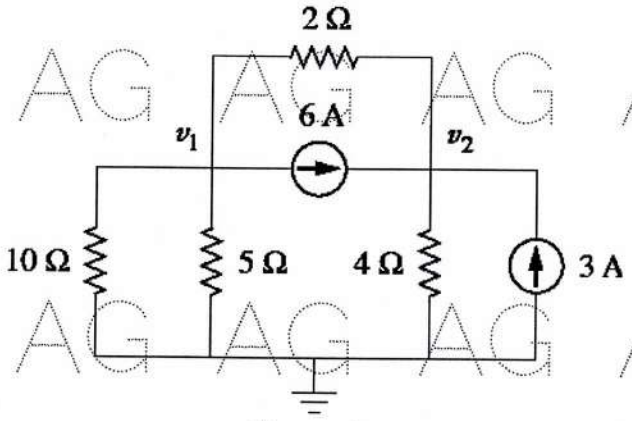

Figure: 2

2.a) Derive the relation between line and phase voltages and currents for a balanced STAR connected system.

b) A three-phase balanced delta connected load of (9+j2) ohm is connected across a 400V, 3ϕ balanced supply. Determine the phase currents and line currents. Assume the phase of sequence to be RYB. Also calculate the power drawn by load. [8+7]

3. With a neat diagram explain about the different parts, operation and applications of the following circuit breakers:
a) Miniature circuits breakers (MCB)
b) Earth leakage circuits breakers (ELCB). [8+7]

4.a) Explain in detail about the important characteristics for Batteries.
b) Describe the pipe earthing used in electrical installations with a neat diagram. [7+8]

5.a) Describe how the speed of the dc motor can be controlled below 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) What are the losses that occur in a transformer and how can these losses be reduced?
b) Draw and explain the torque-slip characteristics of an induction motor. [8+7]

7.a) Explain the VI characteristics of PN Junction diode with neat diagram and explain. What is Static Resistance and Dynamic Resistance?
b) Draw the circuits of a full wave rectifier using 4-diodes. Discuss the relative merits and demerits. [8+7]

8.a) Discuss the characteristic differences between a BJT and a FET. Draw a diagram depicting the structure of a N-channel FET and identify the various terminals and the biasing voltages.
b) Explain how the pinch off voltage can be modified without changing the physical structure of a JFET. [9+6]

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