Code No: 152AP **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech I Year II Semester Examinations, June - 2022
BASIC ELECTRICAL ENGINEERING
(Common to EEE, CSE)

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

Answer any five questions
All questions carry equal marks
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1.a) Describe different types of active elements and passive elements in the circuit analysis.
b) By using the mesh analysis determine the loop currents in circuit shown in figure 1. [8+7]

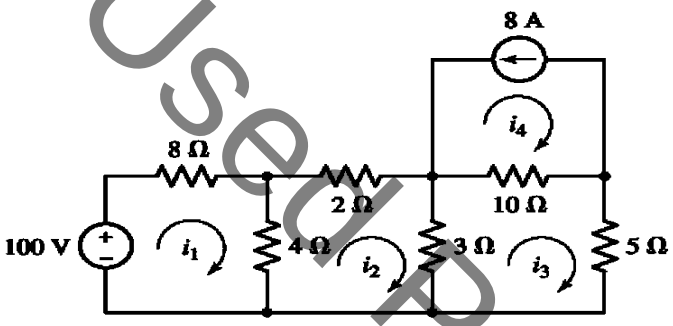

Figure 1

2.a) With relevant diagrams, explain about sinusoidal response of series RC circuit.
b) For the periodic wave form shown in the following figure 2, determine average and rms values. [7+8]

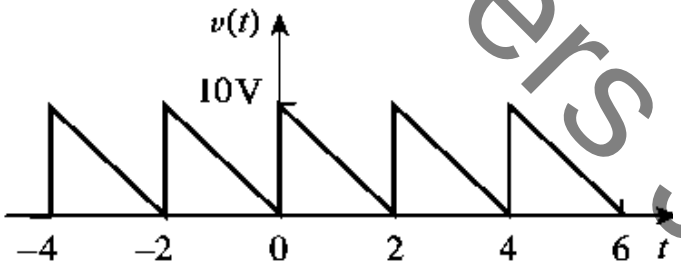

Figure 2

3.a) Derive the condition for saving of a copper in a single-phase auto transformer.
b) A 10 KVA, 500/250 V single phase transformer has its maximum efficiency of 94% when delivering 90% of its rated output at unity pf. Estimate its efficiency when delivering its full load output at pf of 0.8 lagging. [8+7]

4.a) Explain the torque slip characteristics of 3-ϕ Induction motor.
b) Write about construction and working of synchronous generators. [8+7]

5.a) Compare Fuse with Circuit breaker.
b) What are various types of Batteries available? Explain important characteristics of Batteries. [5+10]

6.a) Prove that superposition theorem not valid for power responses.

b) Obtain Thevenin's equivalent circuit for the network shown in figure 3. [8+7]

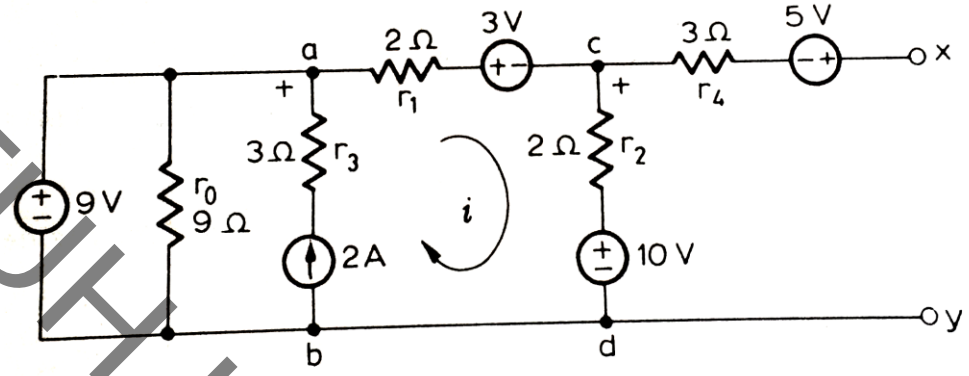

Figure 3

7.a) Derive and explain rotating magnetic field in a three-phase induction motor.

b) A 25 KVA single phase transformer has 250 turns on the primary and 40 turns on the secondary winding. The primary is connected to 1500 V, 50 Hz mains. Calculate (i) primary and secondary currents on full load (ii) secondary emf (iii) maximum flux in the core. [8+7]

8.a) Define power factor, apparent power, active power and reactive power.

b) The impedances of parallel circuit are Z_1= (4+j6) ohms and Z_2 = (12-j8) ohms. If the applied voltage is 220 V, find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram. [8+7]

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