

Code: R5 100206

R5

B.Tech I Year (R05) Supplementary Examinations, May 2012

ELECTRICAL CIRCUITS

(Common to EEE and E.Con.E)

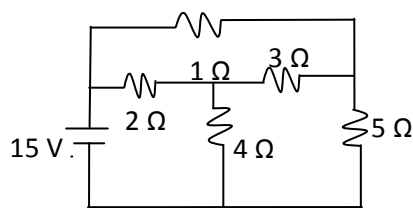
Time: 3 hours

Max Marks: 80

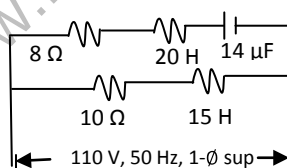
Answer any FIVE questions

All questions carry equal marks

- 1 (a) Explain the voltage-current relationship of for passive elements.
- (b) Find the current supplied by 15 V battery by using star. Delta transformation.



- 2 (a) State and explain faraday's laws of electromagnetic induction.
- (b) An iron ring of mean length 50 cm has an air gap of 1 mm and a winding of 200 turns. If the relative permeability of iron is 400, when a current of 1 A flow in the winding, determine the flux density. Neglect leakage and fringing.
- 3 (a) Show that power dissipated by a pure capacitive circuit excited by a sinusoidal source is zero.
- (b) Calculate the current, power and power factor of the given circuit.



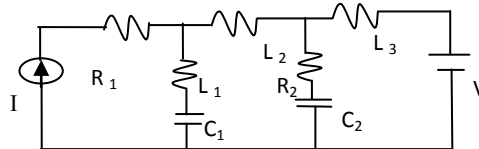
- 4 (a) Write down the advantages and disadvantages of 3-phase circuits over 1-phase circuits.
- (b) Three impedances each of $(10+j3)$ ohm are connected in star to a 220 V, 3-phase, 50 Hz supply. Calculate the line currents.

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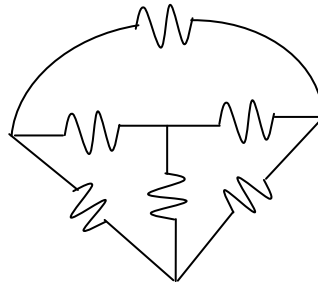
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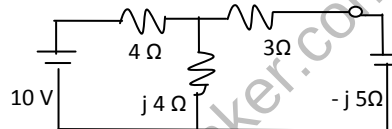
- 5 (a) Draw the dual network for the given circuit. Also write down the procedure to obtain dual network.



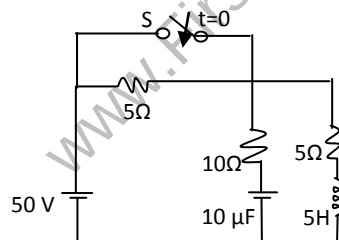
- (b) For a given network draw the graph and choose a possible tree. Construct the basic Tie set schedule. Write the equations for the branch currents in terms of link current and write separately the independent equations



- 6 (a) State and explain maximum power transfer theorem.
(b) Find the current through the capacitor by using Thevenin's theorem.



- 7 Find the initial conditions for the voltage across the capacity, the currents i_1 , i_2 and the derivatives for the circuit shown when the switch is closed at $t = 0$.



- 8 (a) Derive the relation between Z and ABCD parameters in a two port network.
(b) Obtain Hybrid parameters for the given network.

