M.Sc. First Semester (Applied Electronics) (New) (CBS)

15001 : Electrical Engineering & Network Analysis : 1 AE 1

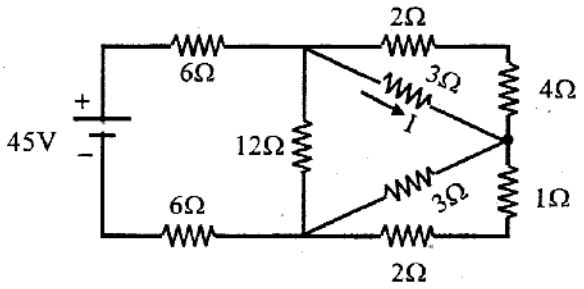
P. Pages : 4 | AV - 3291

Time : Three Hours | Max. Marks : 80

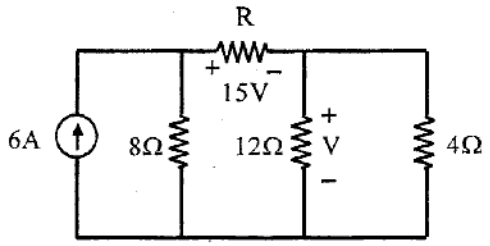
* 0 8 8 4 *

Notes : 1. Due credit will be given to neatness and adequate dimensions.
2. Illustrate your answer necessary with the help of neat sketches.

1. a) Find current I in the network shown in figure. **7**



b) Find 'R' and V in the network shown in figure. **6**



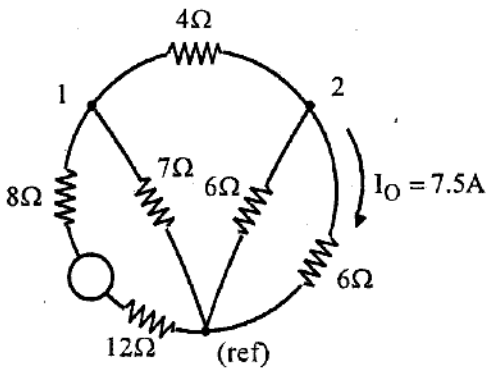
OR

2. a) In a given R – L circuit, R = 2.5Ω, L = 0.2H Find current through circuit and power factor if a-c voltage of 230 ∠30°, 50Hz is applied. **6**

b) A certain inductive coil takes 15A when supply voltage is 230V, 50Hz, If frequency is changed to 40Hz, the current increases to 17.2A Calculate resistance and Inductance of a coil. **7**

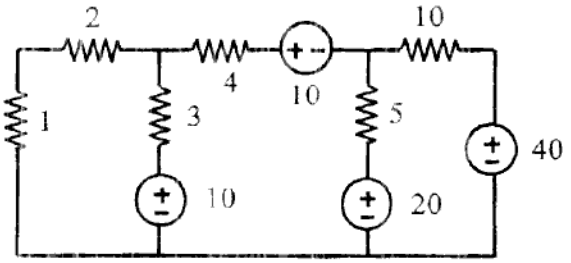
3. a) Derive the EMF equation of transformer. **7**

b) For the network shown in figure. Find V_s, which makes $V_o = 7.5A$. (nodal analysis) **7**



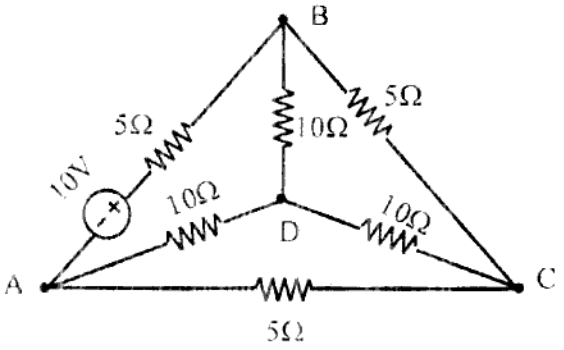
OR

4. a) For the circuit shown obtain current through each element by Mesh analysis. **7**



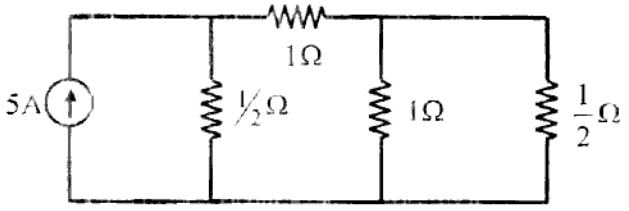
b) Explain in brief the losses in transformer and voltage regulation of transformer. **7**

5. Draw the oriented graph of ckt shown in fig. and write down network equilibrium equations in matrix from. Using KVL (Tie – set – Basis) **13**

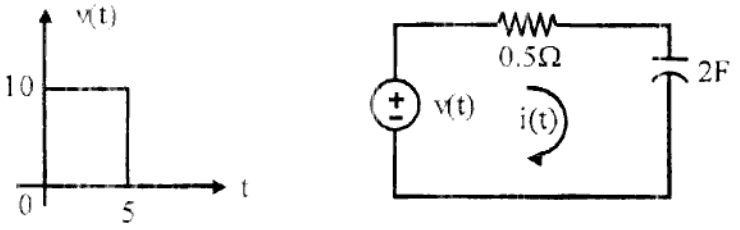


OR

6. For the network shown in fig. Write down the f-cut set matrix and Hence obtain equilibrium equations. **13**



7. a) Determine the current i(t) through the circuit. **7**



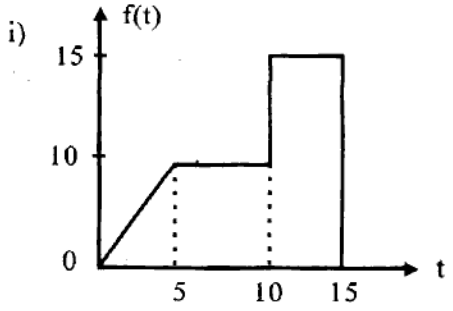
b) Determine the Inverse Laplace transform of following functions F(s); **6**

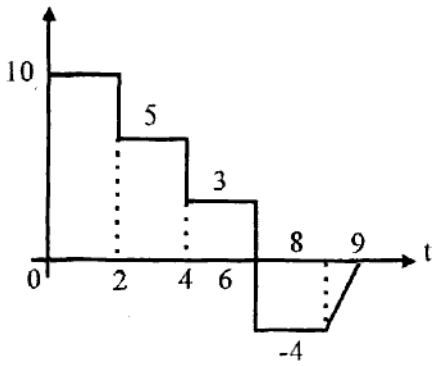
i) $F(s) = \dfrac{3}{s(s^2+6s+9)}$ ii) $F(s) = \dfrac{2(s+1)}{(s+2)(s+3)}$

OR

8. a) Obtain the Laplace transform for following waveforms. 7

i)



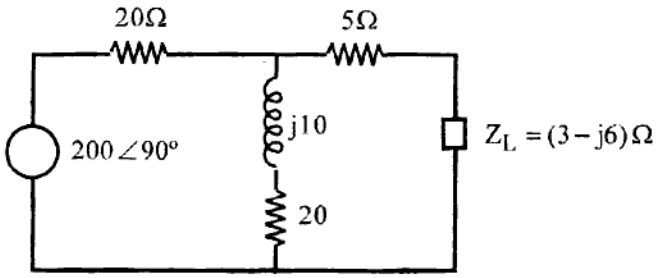


b) Obtain initial value and final value of f(t): 6

$$F(s) = \frac{17s^3 + 18s + 6s + 5}{s^5 + 4s^4 + 3s^3 + 5s^2 + 18s}$$

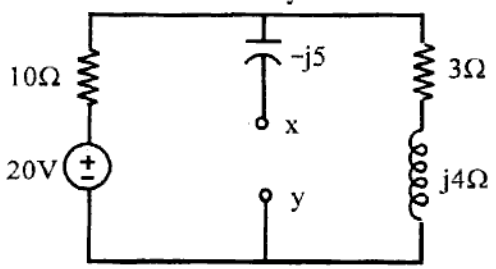
9. a) State and explain maximum power transfer theorem and derive the conditions. 7

b) Find the current through Z_L by Thevenin's theorem shown in figure. 6

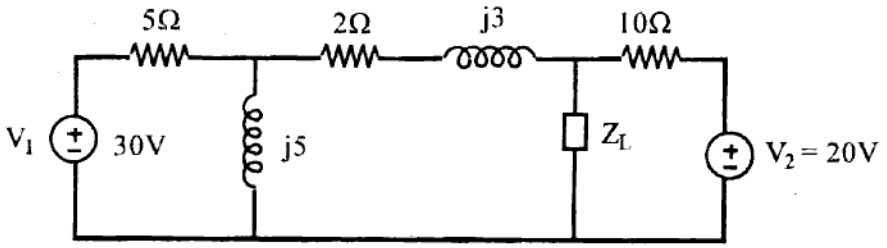


OR

10. a) Obtain the Norton's equivalent ckt at terminals xy shown below. 6

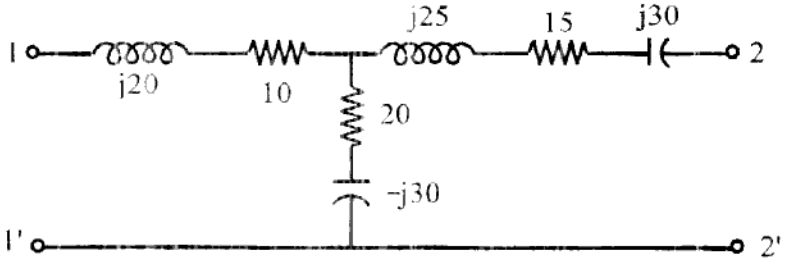


b) By superposition theorem calculate current through "Z_L". 7



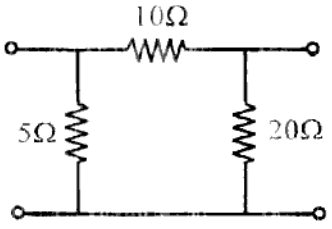
($Z_L = 10 - 2j$)

11. Determine the Z and Y parameters of n/w shown in figure. **14**



OR

12. a) Two identical section of network shown in fig. are connected in parallel, Obtain Y – parameter of resulting network. **7**



b) Determine the h-parameters with following data. 7

i) With o/p shorted (s/c) $V_1 = 25V$, $I_1 = 1A$, $I_2 = 2A$

ii) With i/p terminals open-circuited (o/c) $V_1 = 10V$, $V_2 = 50V$, $I_2 = 2A$

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