Reg. No. :

Question Paper Code: 31343

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Electronics and Communication Engineering

01UEC303 - CIRCUIT THEORY

(Regulation 2013)
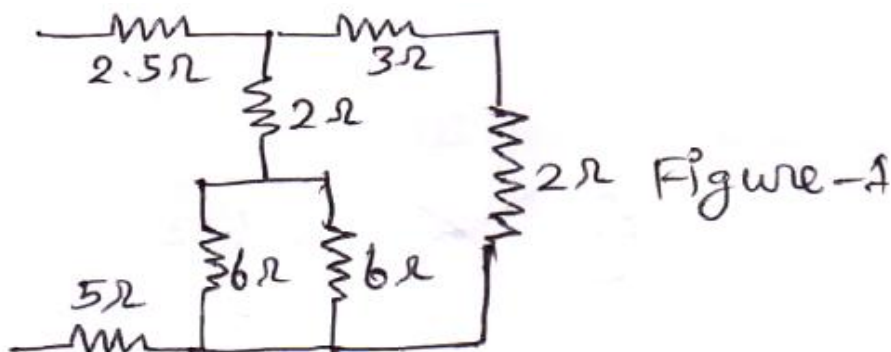
Duration: Three hours   Maximum: 100 Marks
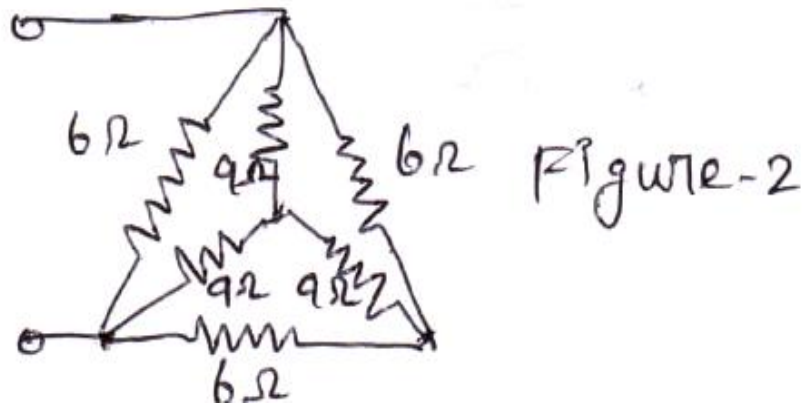
Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define Tree and Co-tree.

2. Determine the equivalent resistance shown in Figure-1.


3. State maximum power transfer theorem.

4. Find Thevenin resistance of circuit shown in Figure 2.

6Ω 9Ω 6Ω Figure-2
9Ω 9Ω
6Ω

5. Find the resonant frequency of the circuit for $R = 100\ \Omega$, $C = 100\ uF$, and $L = 5\ H$.

6. Determine the quality factor of the circuit with $R = 10\ \Omega$, $L = 0.1\ H$, and $C = 10\ uF$.

7. What is coefficient of coupling?

8. How do we measure the power of 3-phase circuit using two wattmeter method?

9. Write the impedence equation for the two port Network.

10. Define hybrid parameter.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Find the node voltage V_a and V_b which is shown in Figure -3 (12)

Figure-3

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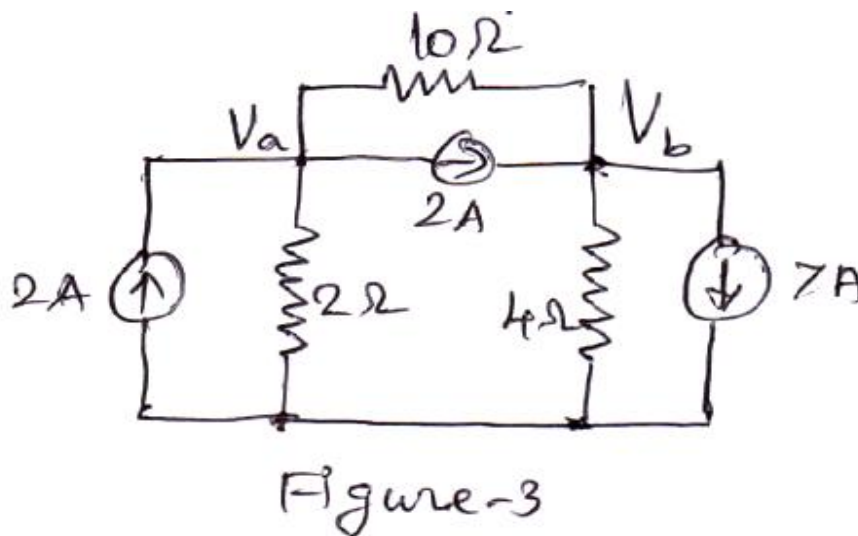
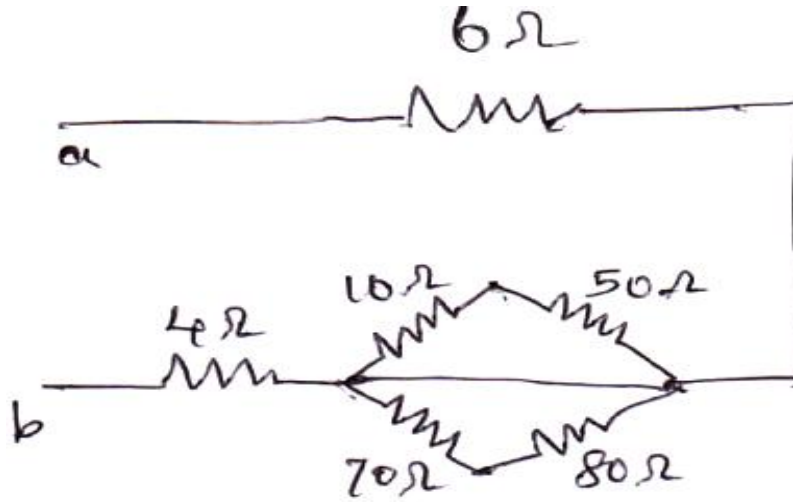(ii) Find the R_{eq} across the terminal *a-b* shown in Figure -4 (4)

Figure - 4

Or

(b) (i) State KVL and KCL. (4)

(ii) Find the current going through 2Ω resistor shown in Figure -5 using mesh analysis. (12)
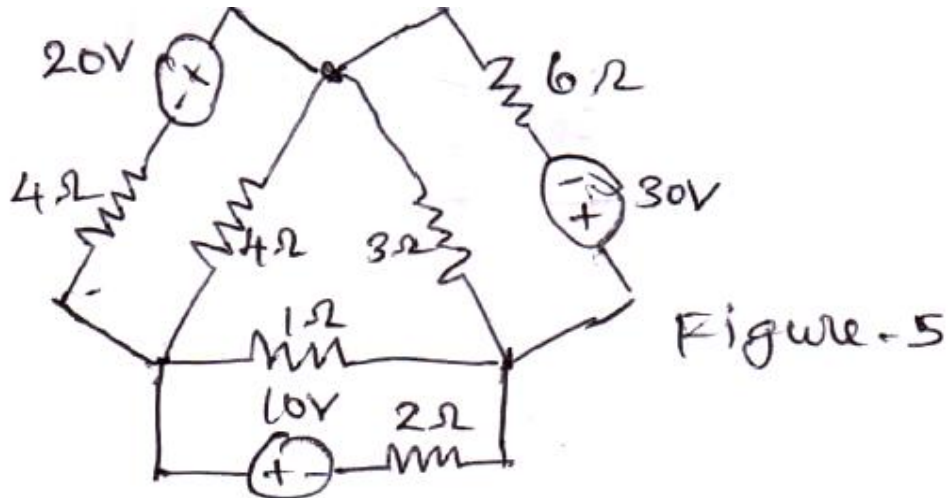

Figure - 5

12. (a) (i) State the superposition theorem. (4)

(ii) Find the current going through 5Ω resistor shown in Figure-6 using superposition theorem. (12)
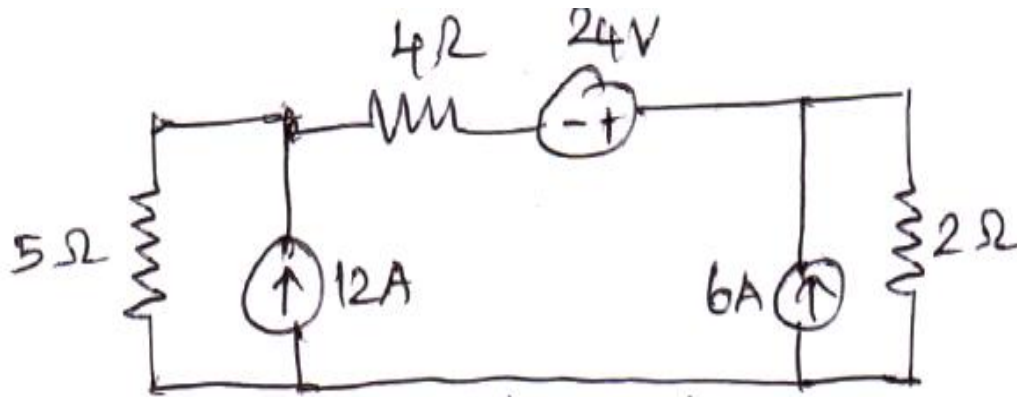
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Figure-6

Or

(b) (i) State Norton theorem. (4)

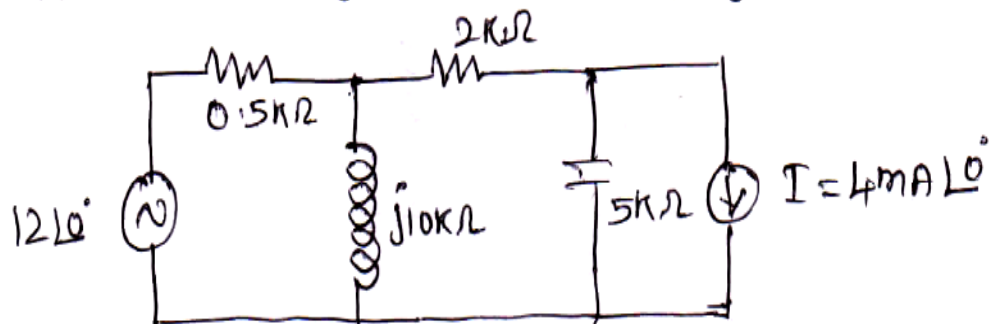(ii) Determine the voltage across inductor shown in Figure -7 . (12)

Figure-7

13. (a) (i) Write a note on Bandwidth and Selectivity of series RLC circuit. (8)

(ii) Derive the expression for resonance frequency of parallel resonance circuit. (8)

Or

(b) A series RL circuit with $R = 50\Omega$ and $L = 10H$ has a constant voltage $V = 100V$ is applied at $t = 0$ by closing of switch find the equation for i, V_R, V_L and current at $t = 0.5$ sec. (16)

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14. (a) Compute the voltage V of the circuit shown in Figure -8. (16)

Figure -8
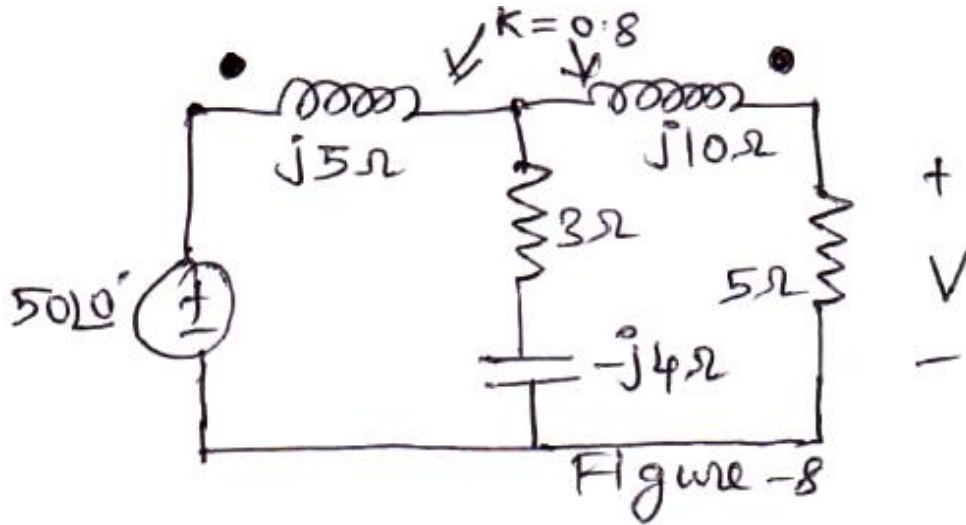
Or

(b) A three phase balanced Delta connected load of $4 + j8$ is connected across 400V, 3-phase balanced supply. Find the phase and line currents, also power drawn by the load. (16)

15. (a) (i) Derive the expression for Admittance parameter. (8)

(ii) Find the Y-parameter for the network shown in Figure -9. (8)
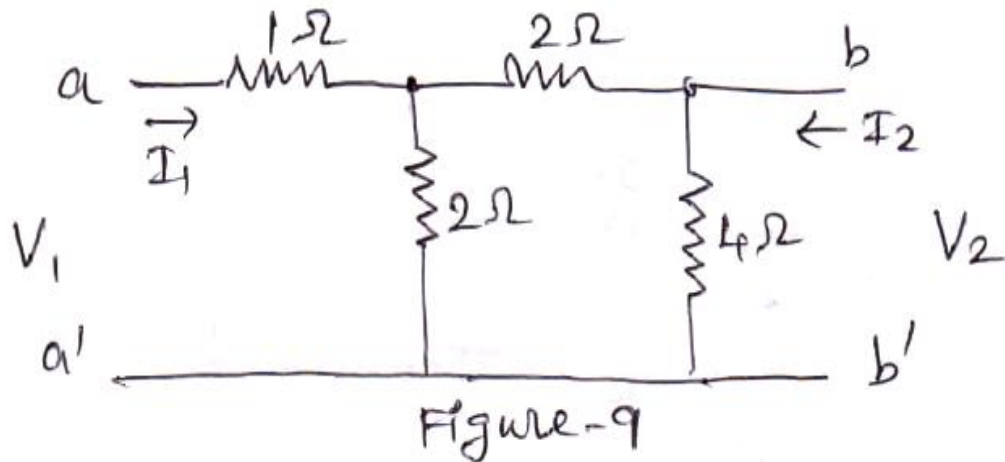
Figure-9

Or

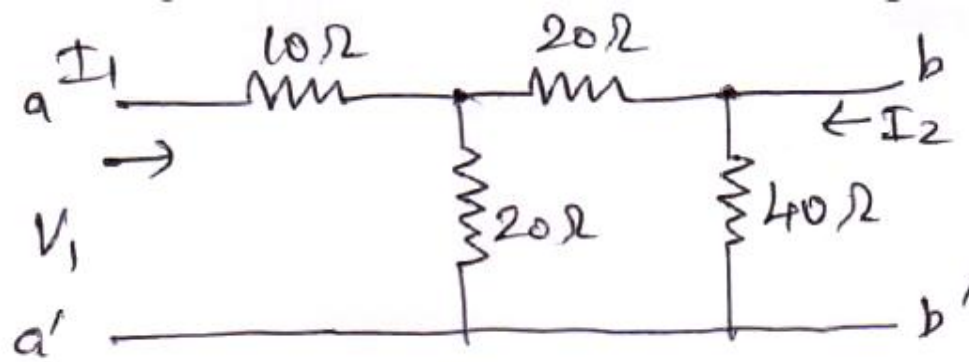(b) Find the h parameter of the network shown in Figure -10. (16)

Figure –10

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