CBCS Scheme

USN | | | | | | | | | | |

15EC34

Third Semester B.E. Degree Examination, Dec.2016/Jan.2017
Network Analysis

Time: 3 hrs. Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

1 a. Derive the expression for i) Δ to Y transformation ii) Y to Δ transformation. **(10 Marks)**

b. Using source Transformation, find power delivered by 50V source. Shown in Fig Q1(b). **(06 Marks)**

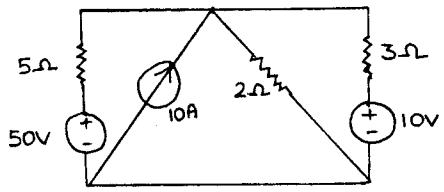

Fig Q1(b)

OR

2 a. Find the voltage across 20Ω resistor in the Network. Shown in Fig Q2(a) by Mesh analysis. **(08 Marks)**

b. Find i, using nodal analysis for the circuit shown in Fig Q2(b). **(08 Marks)**

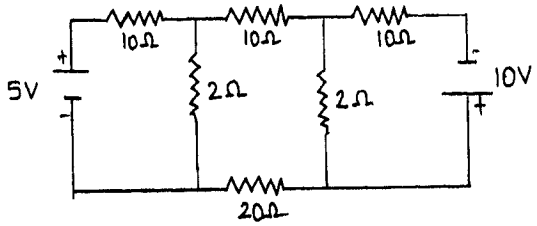

Fig Q2(a)

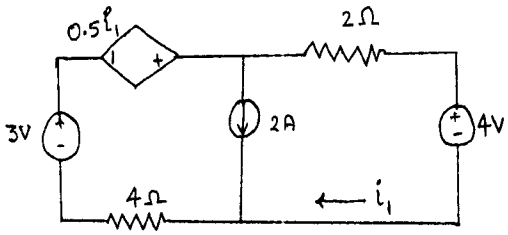

Fig Q2(b)

Module-2

3 a. State and prove maximum power transfer Theorem for AC circuits. **(08 Marks)**

b. For the network shown in Fig Q3(b), obtain the Thevenin's equivalent as seen from terminals p and q. **(08 Marks)**

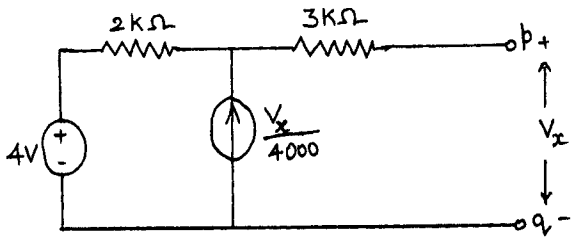

Fig Q3(b)

OR

4 a. State and explain Millman's theorem. **(08 Marks)**

b. Verify reciprocity theorem for the circuit shown in Fig Q4(b). **(08 Marks)**

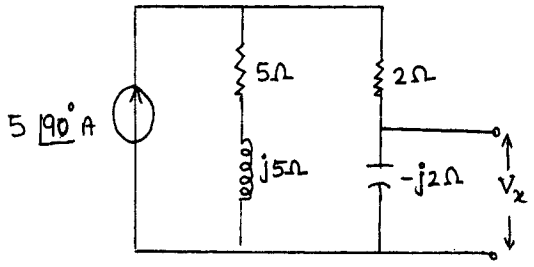

Fig Q4(b)

Module-3

5 a. Stat and prove initial value Theorem and final value theorem. **(08 Marks)**

b. In the circuit shown in Fig Q5(b) V = 10V, R = 10Ω, L = 1H, C = 10μF and V_c = 0. Find $i(0^+)$, $\frac{di}{dt}(0^+)$ and $\frac{d^2i}{dt^2}(0^+)$, it switch K is closed at t = 0. **(08 Marks)**

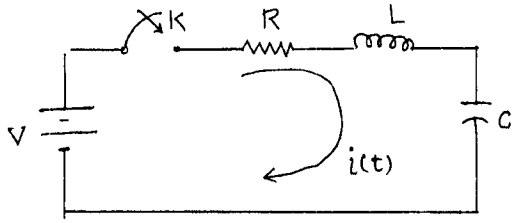

Fig Q5(b)

OR

6 a. In the network shown in Fig Q6(a), a steady state is reached with the switch K open. At t = 0, the switch is closed. For the element values given, determine the values of $V_a(0^-)$ and $V_a(0^+)$. **(08 Marks)**

b. Obtain the Laplace Transform of saw tooth waveform shown in Fig Q6(b). **(08 Marks)**

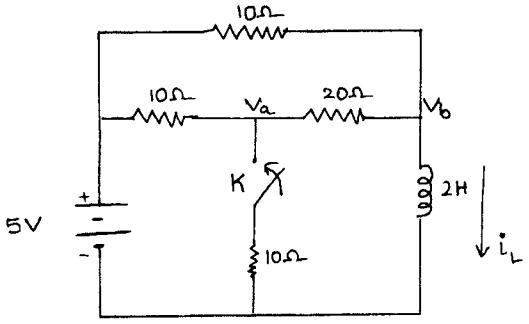

Fig Q6(a)

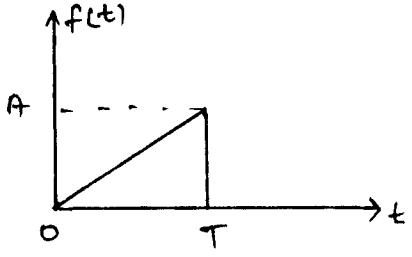

Fig Q6(b)

Module-4

7 a. Prove that $f_0 = \sqrt{f_1 f_2}$ where f_1 and f_2 are the two half power frequencies of a resonant circuits. **(08 Marks)**

b. A series RLC circuit consists of R = 10Ω, L = 0.01H and C = 0.01μF is connected across a supply of 10mV. Determine, i) f_0 ii) Q-factor iii) BW iv) f_1 and f_2 and v) I_0. **(08 Marks)**

OR

8 a. Obtain the expression for the resonant frequency for the circuit shown in Fig Q8(a) **(08 Marks)**

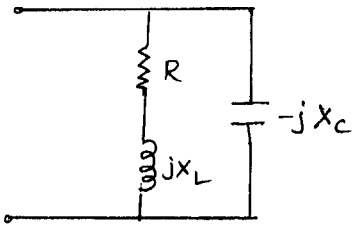

Fig Q8(a)

b. An RLC series circuit has an inductive coil of 'R' Ω resistance and inductance of 'L' H is in series with a capacitor 'C' F. The circuit draws a maximum current of 15A when connected to 230V, 50Hz supply. If the Q-factor is 5, find the parameter of the circuit. **(08 Marks)**

Module-5

9 a. Derive the z-parameters in terms of Y parameters. **(08 Marks)**

b. Determine Y parameter of the two – port network shown in Fig Q9(b). **(08 Marks)**

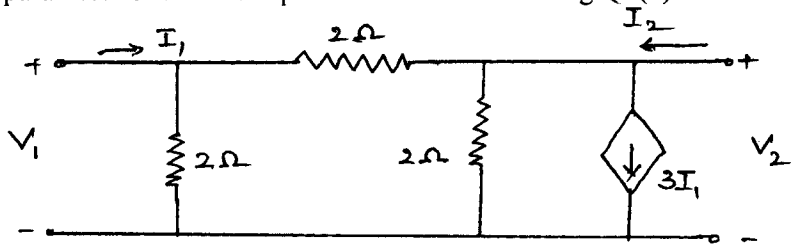

Fig Q9(b)

OR

10 a. Obtain hybrid parameters (h) in terms of impedance parameters (z). **(08 Marks)**

b. Find the Y parameters for the circuit shown in Fig Q10 (b). Then use the parameter relationship to find ABCD parameters. **(08 Marks)**

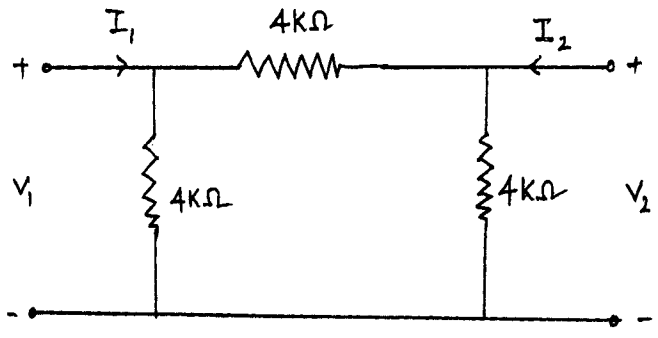

Fig Q10(b)

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