CBCS SCHEME

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

15EC34

Third Semester B.E. Degree Examination, June/July 2019
Network Analysis

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. Explain E-shift and I-shift with an example. **(08 Marks)**

b. Find the voltage across the capacitor of 10 Ω reactance of the network shown in Fig.Q1(b) by loop current method.

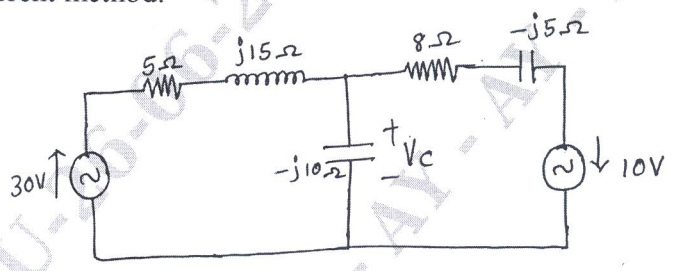

Fig.Q1(b) **(08 Marks)**

OR

2 a. Determine the equivalent resistance between the terminals A and B in the network of Fig.Q2(a) using star-delta transformation.

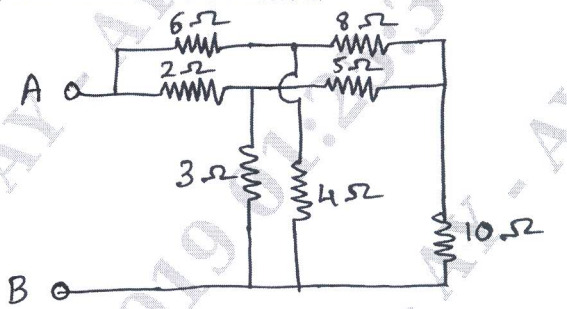

Fig.Q2(a) **(08 Marks)**

b. Find the voltages at nodes 1, 2, 3 and 4 for the network shown in Fig.Q2(b) using nodal analysis.

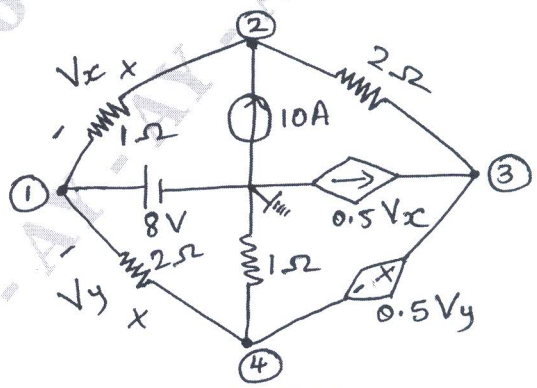

Fig.Q2(b) **(08 Marks)**

Module-2

3 a. State and explain superposition theorem. **(08 Marks)**

b. Obtain Thevenin's equivalent circuit across A and B for the network shown in Fig.Q3(b).

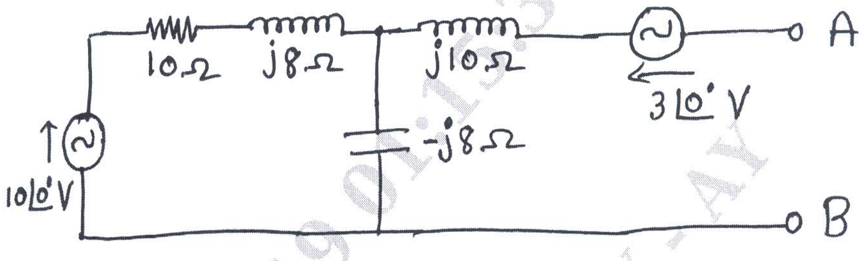

Fig.Q3(b) **(08 Marks)**

OR

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

b. Find the value of Z_L in the circuit shown in Fig.Q4(b) using maximum power transfer theorem and hence the maximum power.

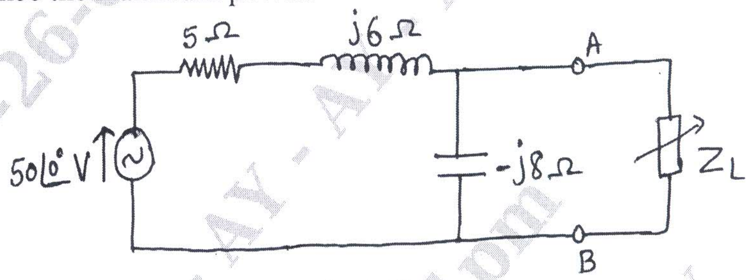

Fig.Q4(b) **(08 Marks)**

Module-3

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

b. In the network shown in Fig.Q5(b), K is changed from position a to b at t = 0. Solve for i, $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at $t = 0^+$, if R = 100 Ω, L = 0.1 H and C = 0.25 μF and V = 100 V. Assume that the capacitor is initially uncharged.

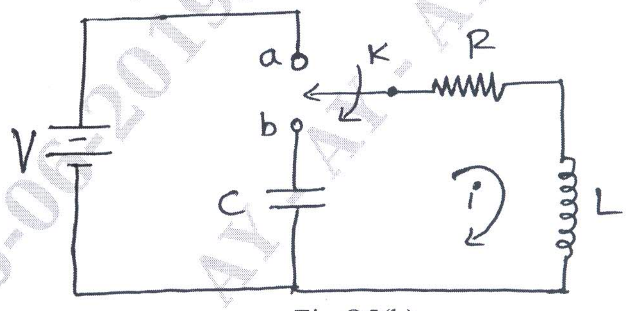

Fig.Q5(b) **(08 Marks)**

OR

6 a. What is the significance of initial conditions? Write a note on initials and final conditions in basic circuit elements. **(08 Marks)**

b. Find the Laplace transform of (i) f(t) = u(t) (ii) f(t) = t. **(08 Marks)**

Module-4

7 a. Derive an expression for half power frequencies for a series resonant circuit, **(08 Marks)**

b. For the network shown in Fig.Q7(b), find the value of L at which circuit resonates at a frequency of 600 rad/sec.

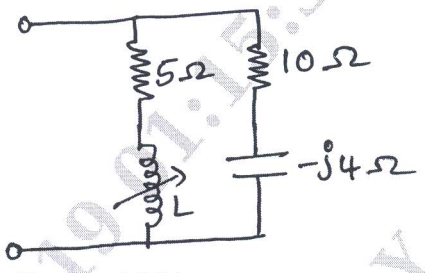

Fig.Q7(b) **(08 Marks)**

OR

8 a. Obtain the expression for the resonant frequency and the dynamic impedance of a parallel resonant circuit. **(08 Marks)**

b. An RLC series resonant circuit draws a maximum current of 10 Amps, when connected to 230 V, 50 Hz supply. If the Q-factor is 5, find the parameters of the circuit. **(08 Marks)**

Module-5

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

b. Obtain the h-parameters for the circuit shown in Fig.Q9(b).

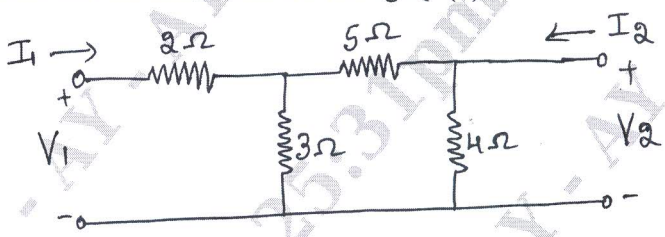

Fig.Q9(b) **(08 Marks)**

OR

10 a. Express h-parameters interms of z-parameters. **(08 Marks)**

b. Find the y-parameters for the circuit shown in Fig.Q10(b). The use parameter relationships to find h-parameter.

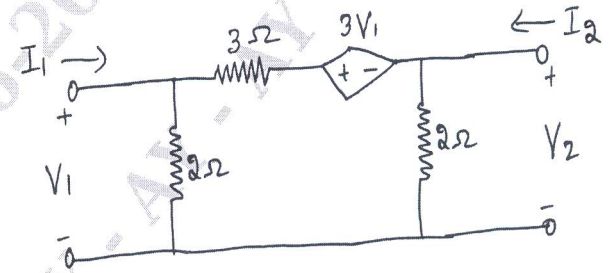

Fig.Q10(b) **(08 Marks)**

* * * * *