CBCS SCHEME

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

15EC34

Third Semester B.E. Degree Examination, Aug./Sept.2020
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. Reduce the circuit shown in Fig.Q1(a) into single voltage source with series resistance between terminals A and B.

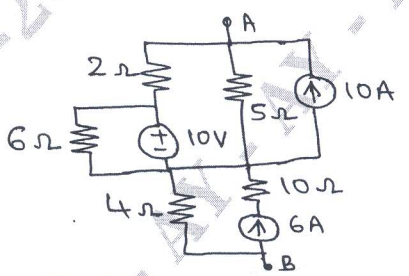

Fig.Q1(a) **(06 Marks)**

b. Using Mesh analysis, find the current I_1 for the circuit shown in Fig.Q1(b).

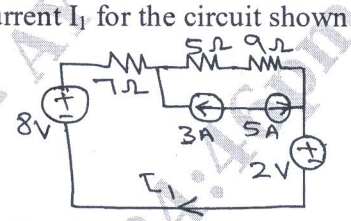

Fig.Q1(b) **(06 Marks)**

c. Explain the concept of Super node. **(04 Marks)**

OR

2 a. Determine the resistance between terminals A and B of the circuit shown in Fig.Q2(a) using Star to Delta conversion.

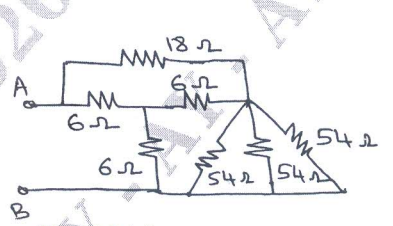

Fig.Q2(a) **(06 Marks)**

b. Using Nodal analysis, find the value of V_x in the circuit shown in Fig.Q2(b), such that the current through $(2 + j3)\Omega$. Impedance is zero.

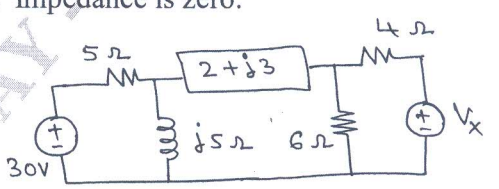

Fig.Q2(b) **(06 Marks)**

c. Explain the Dependent sources. **(04 Marks)**

Module-2

3 a. For the circuit shown in Fig.Q3(a), find the current through 20 Ω resistor using super position theorem.

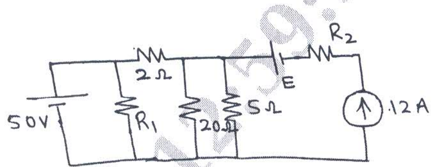

Fig.Q3(a)

(08 Marks)

b. For ac circuits, prove that the maximum power deliver to load is $\frac{(V_{th})^2}{8R_{th}}$, where V_{th} – Thevenin's equivalent voltage and R_{th} – Thevenins equivalent resistance.

(08 Marks)

OR

4 a. State the Millman's theorem. Using Millman's theorem, determine the current through (2+j2)Ω impedance for the network shown in Fig.Q4(a).

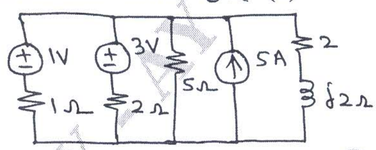

Fig.Q4(a)

(08 Marks)

b. State the Thevinin's Theorem and obtain the Thevinin's equivalent circuit for the circuit shown in Fig.Q4(b).

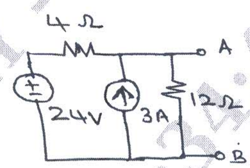

Fig.Q4(b)

(08 Marks)

Module-3

5 a. Explain the behavior of a inductor and capacitor under switching conditions in detail.

(08 Marks)

b. The switch is changed from position to position 2 at t = 0. Steady State condition have been reached in position 1. Find the value i , $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ at $t = 0^+$ for the circuit shown in Fig.Q5(b).

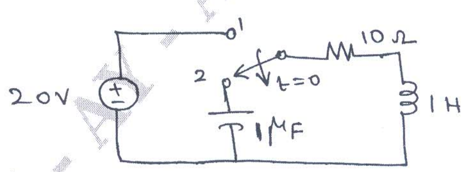

Fig.Q5(b)

(08 Marks)

OR

6 a. Find the Laplace of f(t) shown in Fig.Q6(a).

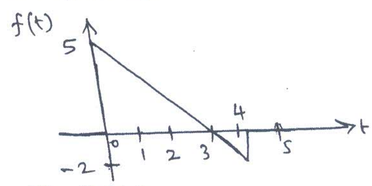

Fig.Q6(a)

(08 Marks)