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

Time: 3 hrs.

Max. Marks: 80

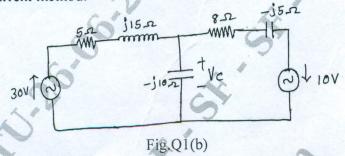
Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

Explain E-shift and I-shift with an example. 1

(08 Marks)

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



(08 Marks)

OR

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

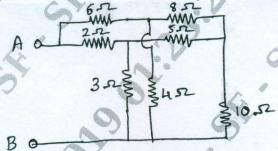
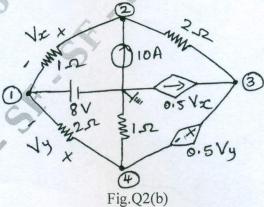


Fig.Q2(a)

(08 Marks)

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



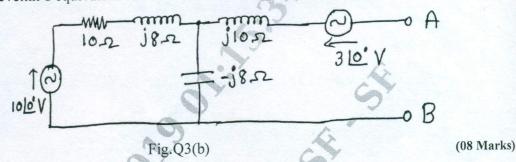
(08 Marks)

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).

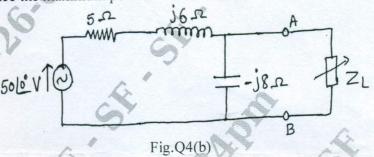


OR

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.



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Module-3

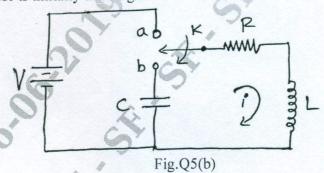
5 a. State and prove initial value theorem and final value theorem.

(08 Marks)

(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 $R=100~\Omega$, L=0.1~H and $C=0.25~\mu F$ and V=100~V. Assume

that the capacitor is initially uncharged.



(08 Marks)

OR

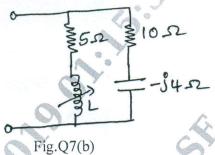
- 6 a. What is the significance of initial conditions? Write a note on initials and final conditions in basic circuit elements. (08 Marks)
 - b. Find the Laplace transform of (i) f(t) = u(t)

(ii) f(t) = t.

(08 Marks)

Module-4

- 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.



(08 Marks)

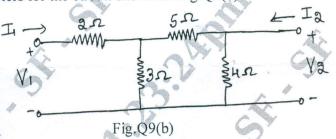
OR

- 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

Derive the Y-parameters in terms of ABCD parameters.

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

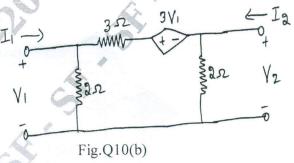


(08 Marks)

(08 Marks)

OR

- Express h-parameters in terms of z-parameters.
- (08 Marks)
 - Find the y-parameters for the circuit shown in Fig.Q10(b). The use parameter relationships to find h-parameter.



(08 Marks)