U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E. **Semester: III**
Branch: ES Cluster (EEE/TCE/ECE/EIE/MD) **Duration: 3 hrs.**
Course Code: 19ES3CCECA **Max Marks: 100**
Course: ELECTRICAL CIRCUIT ANALYSIS

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

1 a) By using Source Transformation, calculate single voltage equivalent for the network shown in the Fig.1.a. **10**

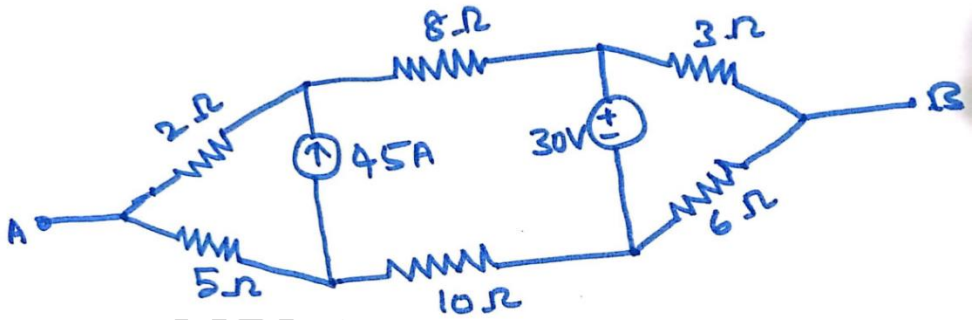

Fig. 1.a.

b) Explain the concept of Super-node analysis with an example. **06**

c) Explain Independent and dependent sources. **04**

OR

2 a) Calculate mesh currents using mesh analysis for the circuit shown in the Fig.2. a. **10**

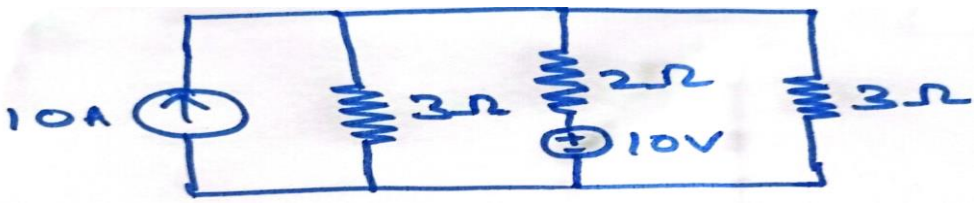

Fig.2.a.

b) Determine the node voltage by nodal analysis for the given network of Fig.2.b. **10**

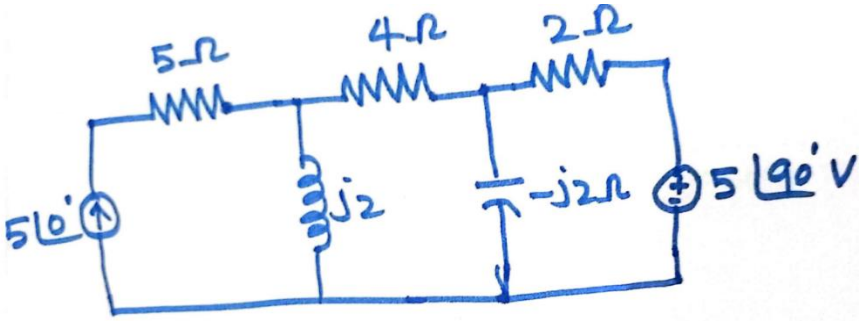

Fig.2.b.

UNIT - II

3 a) A series RLC circuit consist of R=10 Ω, L=0.01 H, and C=0.01 μF is connected across a supply of 10mV. Determine (i) fo (ii) Q-factor (iii) BW (iv) f1 and f2 (v) Io **10**

b) Explain with examples the principles of Duality by graphical method. **10**

UNIT - III

4 a) Determine the Thevenin's equivalent circuit across the terminals A-B of the network shown in the Fig.4.a **10**

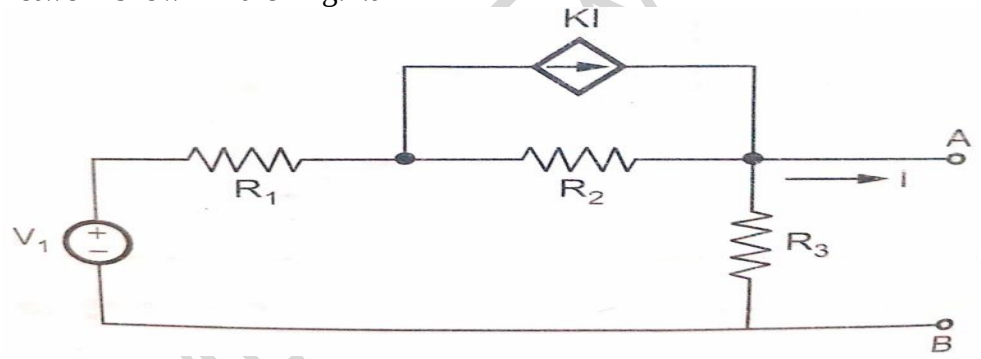

Fig.4.a

b) Determine the current through 10Ω resistance of the network shown in Fig.4.a using Superposition Theorem. **10**

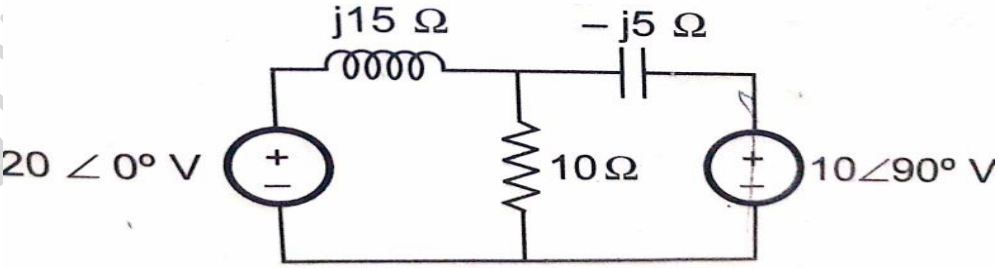

Fig.4.b.

UNIT - IV

5 a) Calculate the expression for the current ina series RLC circuit fed by a D.C. voltage of 20V with R=4Ω, L=1 H, and C=1/4 F. Assume initial conditions to be zero. **10**

b) Determine the Laplace transform of the periodic function shown in the Fig. 5.b. **10**

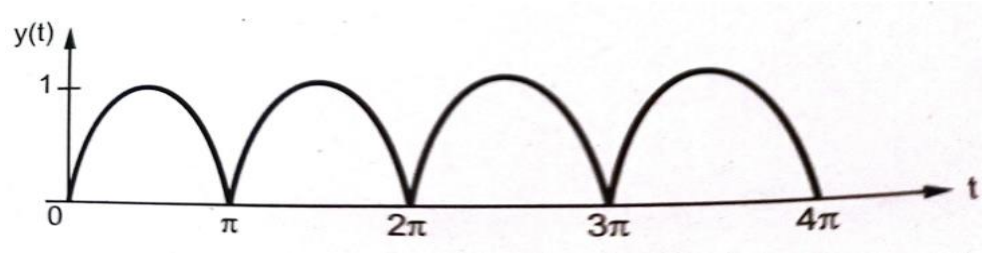

Fig. 5.b.

OR

6 a) State & prove Initial value theorem and Final value theorem. **10**

b) The network shown in the Fig.6.b. is under steady state condition with switch K is at position 1. Determine expression for i(t) if switch K is moved to position 2. Draw variation of i(t). **10**

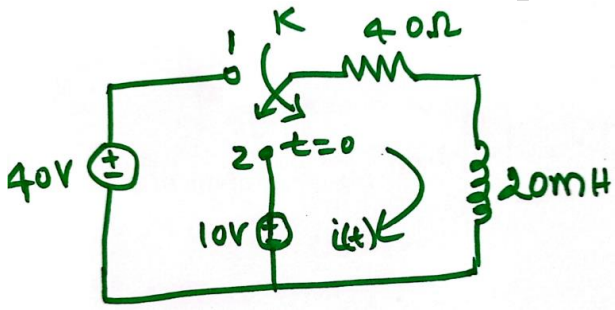

Fig.6.b

UNIT - V

7 a) Obtain Z-Parameter of the circuit shown in the Fig. **Fig.7.a** **10**

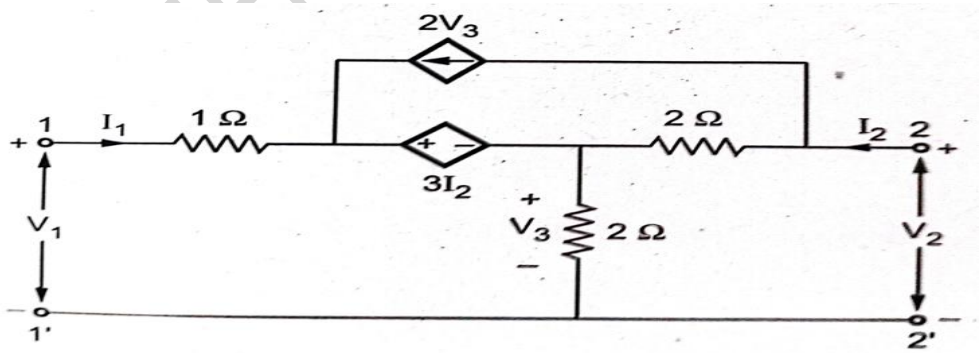

Fig.7.a

b) Determine 'Y' parameter of the network shown in **Fig.7.b.** **10**

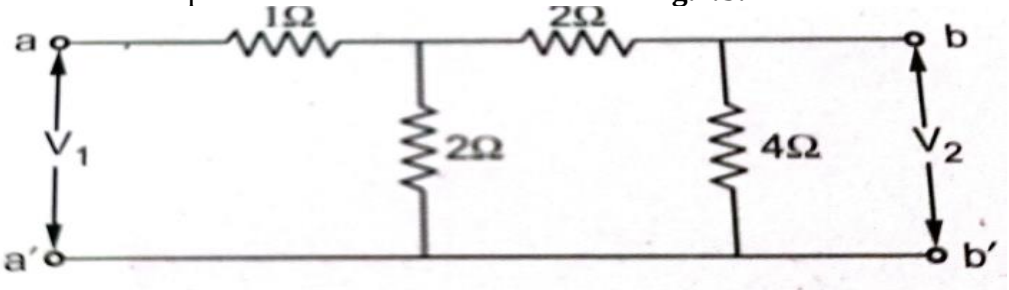

Fig.7.b.

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