U.S.N.										

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

Autonomous Institute Affiliated to VTU

May 2023 Semester End Main 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 **Date: 17.05.2023**

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) Apply mesh analysis and find I_1, I_2 and I_3 for the circuit shown in Fig 1.1 **10**

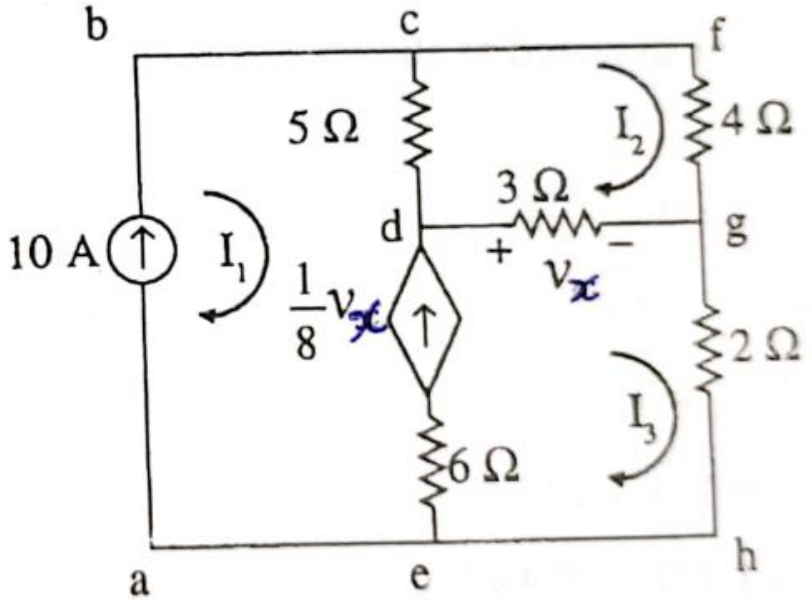


Fig 1.1

b) Use nodal analysis to find current flowing through 4Ω in the circuit shown in Fig 1.2 **10**

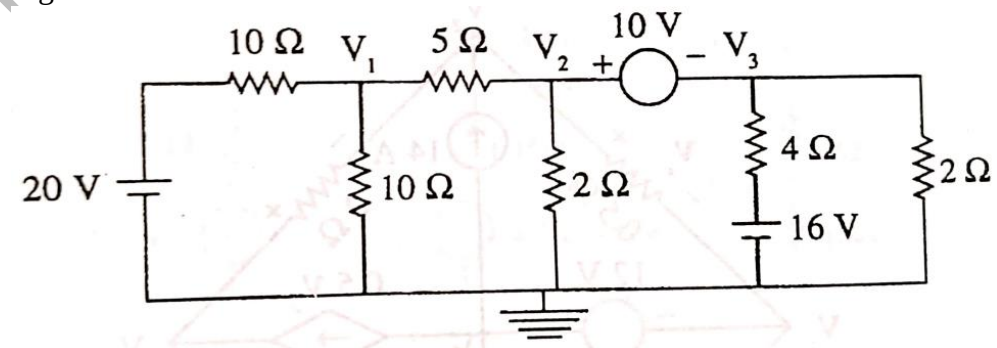


Fig 1.2

OR

2 a) Find all branch currents using nodal analysis for the circuit shown in Fig 2.1 **10**

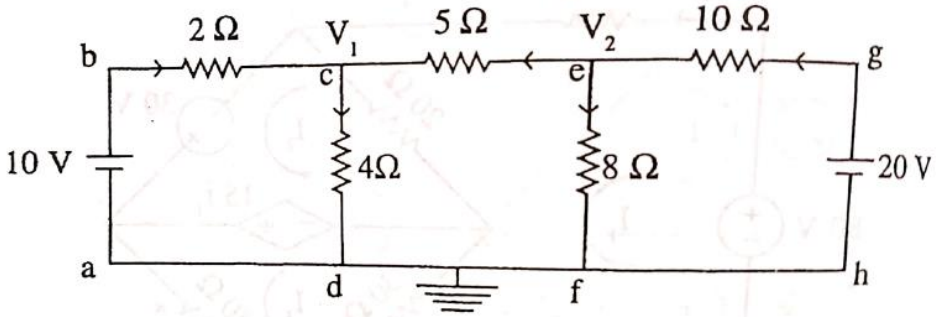


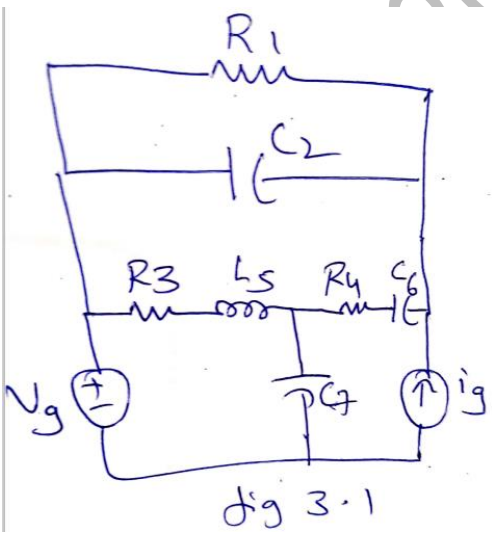
Fig 2.1

b) With relevant example explain source transformation and source shifting **10**

UNIT - II

3 a) Derive the expression for the cutoff frequency, bandwidth and quality factor for a series resonant circuit **10**

b) For the network shown in fig 3.1 draw the oriented graph. Select a tree and write the tie set and cutset matrices. Also write the incidence matrix. **10**



dig 3.1

UNIT - III

4 a) State maximum power transfer theorem and derive an expression for maximum power **07**

b) For the circuit shown in Fig 4.1 find the power dissipated in a 5 Ω resistor connected between A and B using Norton theorem **08**

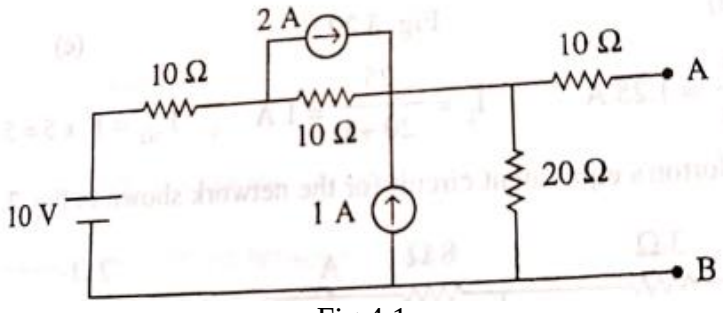


Fig 4.1

c) Using Millman's theorem find the current through the load resistance R_L= 10 Ω for the circuit shown in Fig 4.2 **05**

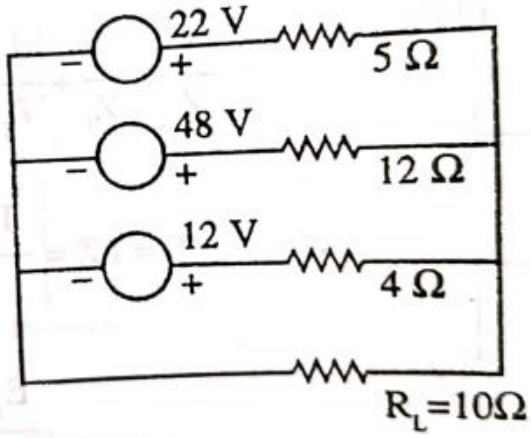


Fig 4.2

UNIT - IV

5 a) State and prove final value theorem **06**

b) A steady state is reached when switch is closed. At t=0 switch is open. Find i(0+), di(0+) / dt, $d^2i(0+) / dt^2$ for the circuit shown in fig 5.1 **08**

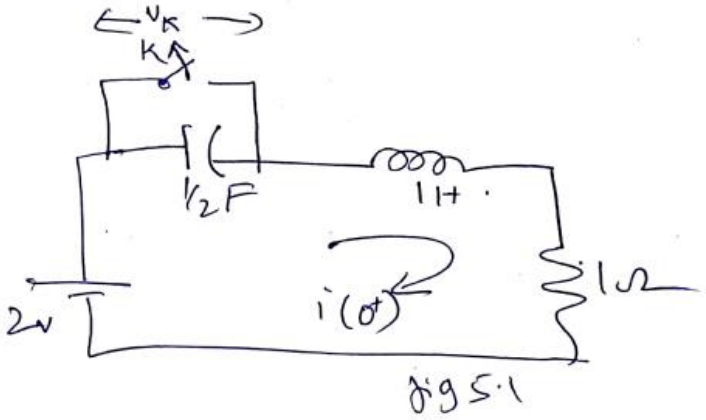


fig 5.1

c) Find the Laplace transform of the waveform shown in fig 5.2 **06**

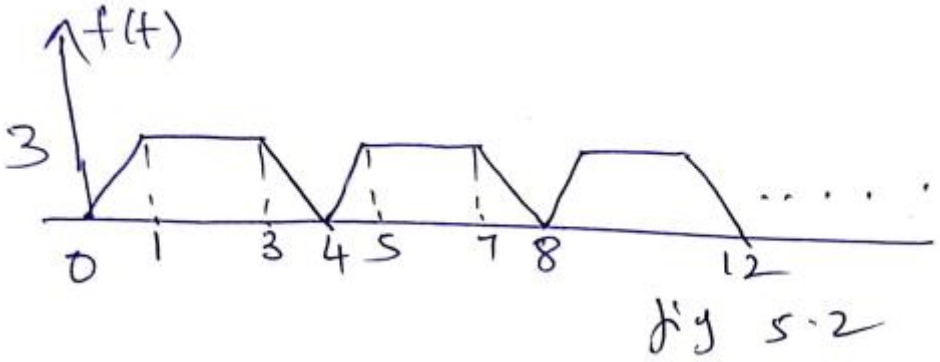


fig 5.2

OR

6 a) Find the Laplace transform of the waveform given in Fig 6.1 **06**

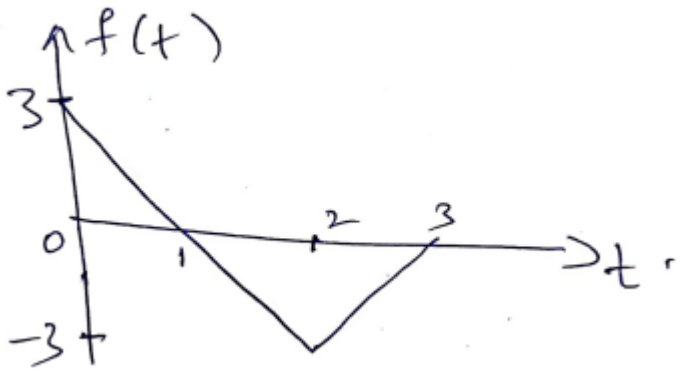


Fig 6.1

b) State and prove initial value theorem **06**

c) For the network shown in Fig 6.2 R=1kΩ, L=1H, C=0.1μf switch k is closed and steady state has been reached. At t=0, switch is opened. Find i(0+), di(0+)/dt, $d^2i(0+)/dt^2$ **08**

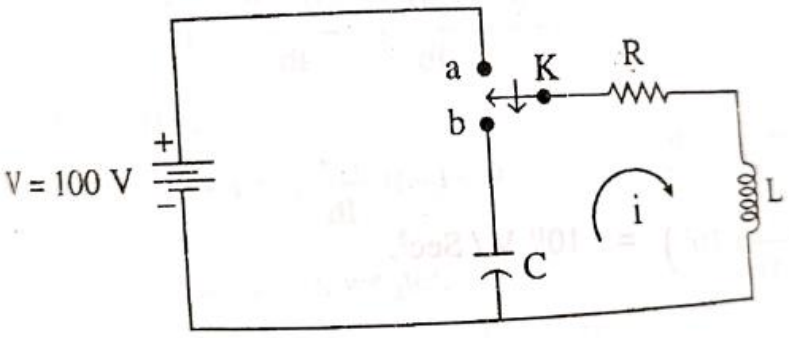


Fig 6.2

UNIT - V

7 a) Define Z parameters **04**

b) Express H-parameters in terms of T parameter by relevant conversions. **08**

c) Find Y parameters for the circuit shown in fig 7.1. **08**

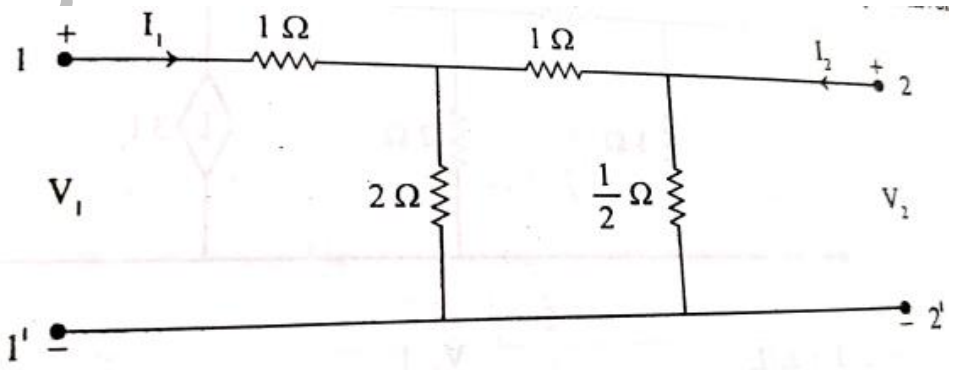


Fig 7.1

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