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

Autonomous Institute Affiliated to VTU

September / October 2024 Supplementary Examinations

Programme: B.E.　　　　　　　　　　　　　　　　　　　　**Semester: III**
Branch: ES Cluster (EEE/ET/ECE/EIE/MD)　　　　　**Duration: 3 hrs.**
Course Code: 19ES3CCECA　　　　　　　　　　　　　**Max Marks: 100**
Course: Electrical Circuit Analysis
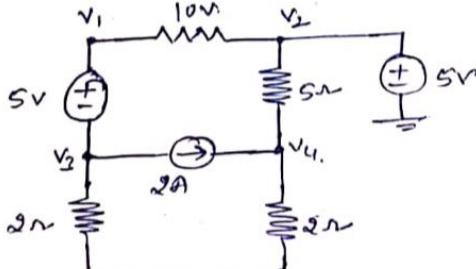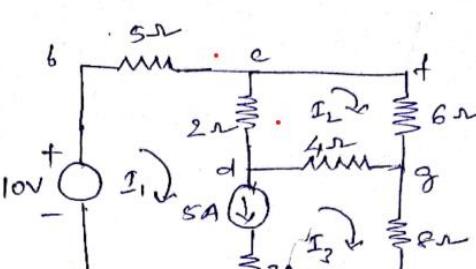
Instructions:　1.Answer any FIVE full questions, choosing one full question from each unit.
　　　　　　　　2. Missing data, if any, may be suitably assumed.

|			**UNIT - I**	**CO**	**PO**	**Marks**
1	a)		Distinguish the following: i)　　Active and Passive elements ii)　　Linear and Non-linear elements iii)　　Unilateral & Bilateral Elements	CO1	PO1	**06**
	b)		For the network shown below, determine the node voltages V1,V2,V3 and V4 using Nodal analysis for the fig.1.(b) fig.1.(b)	CO1	PO2	**07**
	c)		Use mesh current analysis to find the various currents flowing in the network shown in fig.1(c) fig.1.(c)	CO1	PO1	**07**
			OR			
2	a)		Find the power delivered by 50V source shown in fig.2 (a) using source transformation.	CO1	PO1	**06**

Fig 2.(a).
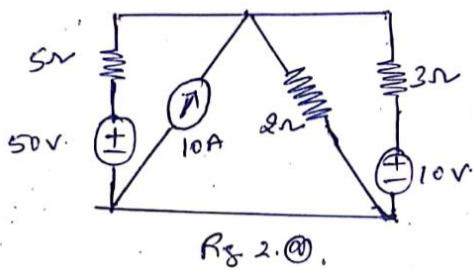
	b)	Three impedances are connected in star. Obtain expression for their delta connected equivalent. Also find the star equivalent of the following circuit shown in fig.2 (b)	CO1	PO2	**07**

fig. 2.(b)
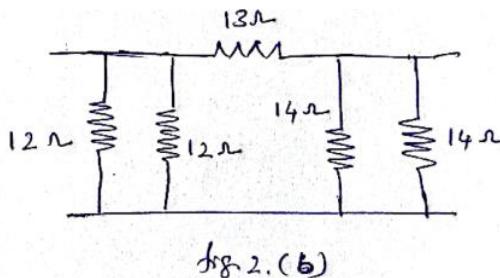
	c)	Find the total power delivered in the circuit using mesh-current method shown in fig.2 (c)	CO1	PO1	**07**

fig. 2. (c).
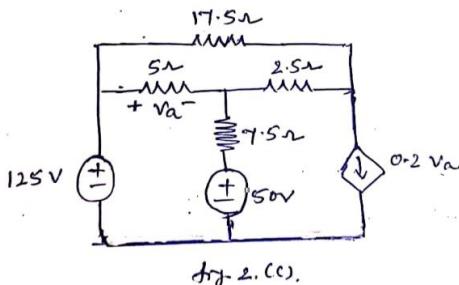
UNIT - II

3	a)	Define with example: (i) Oriented graph (ii)Tree (iii) Fundamental cut set	CO2	PO1	**06**
	b)	Explain with examples the principles of duality	CO2	PO2	**07**
	c)	The reduced incidence matrix of a graph of a network is given below. Draw the oriented graph corresponding to it. $$\begin{bmatrix} -1 & +1 & 0 & 0 & 0 & -1 \\ 0 & -1 & -1 & +1 & 0 & 0 \\ 0 & 0 & +1 & 0 & -1 & +1 \end{bmatrix}$$	CO2	PO2	**07**

UNIT - III

4	a)	Use superposition theorem to find Vx in the circuit shown in fig.4 (a)	CO2	PO1	**10**

fig 4.(a)
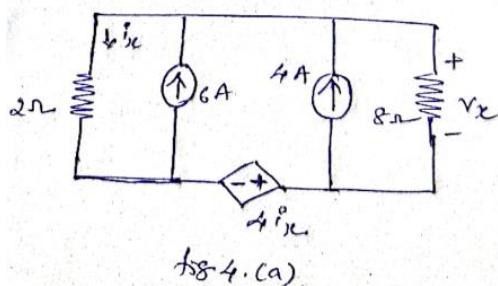
	b)	Calculate Thevenins equivalent circuit across AB for the network shown in fig.4 (b)	CO2	PO2	10

fig-4.(b)
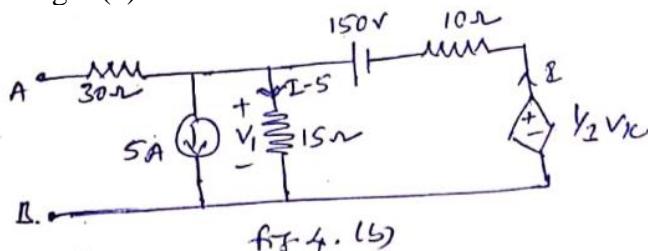
UNIT - IV

5	a)	State and prove initial and final value theorems	CO3	PO1	05
	b)	In the circuit shown fig.5 (b). Switch K is changed from 1 to 2 at t=0, steady state having been attained in position 1. Find the values of i, di/dt and d^2i/dt^2 at t=0+. fig 5(b).	CO3	PO2	07
	c)	Obtain the Laplace transform of the function shown in fig.5 (c) fig.5 (c).	CO3	PO2	08
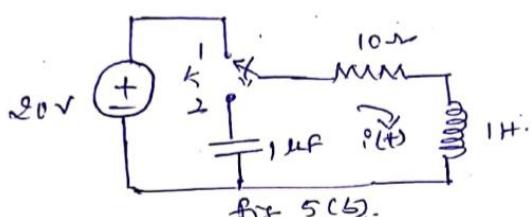
OR
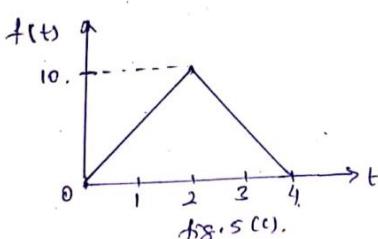
6	a)	What is initial condition, explain the effect of initial condition on the elements of network?	CO3	PO1	06
	b)	In the circuit shown in fig.6 (b), V=10v, R=10Ω, L=1H, C=0.1µF and Vc(0) = 0. Find i(0+), di(0+)/dt and $d^2i(0+)/dt^2$	CO3	PO2	07

fig 6.(b)
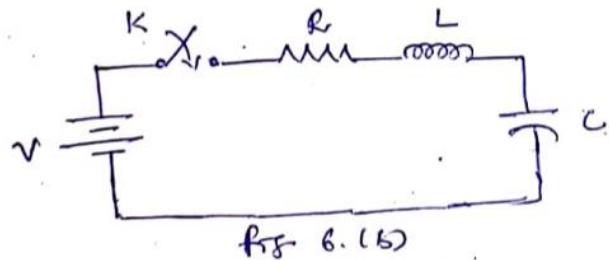
	c)	Find the Laplace transform of the waveform shown in fig.6 (c)	CO3	PO2	07

fig 6 (c).
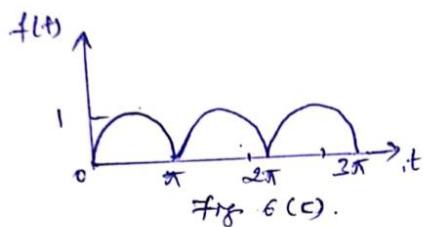
		UNIT - V			
7	a)	Write a note on h parameters	CO4	PO1	06
	b)	Determine the Z parameters for the circuit shown in fig.7 (b)	CO4	PO2	06

fig: 7.(b)
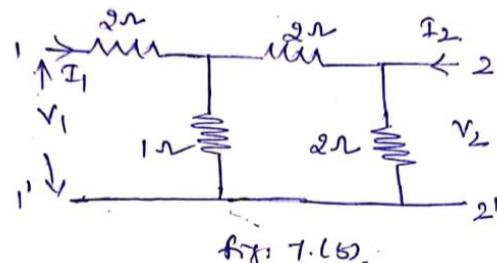
	c)	Determine the transmission parameters for the network shown in fig.7 (c)	CO4	PO2	08

fig 7 (c)

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