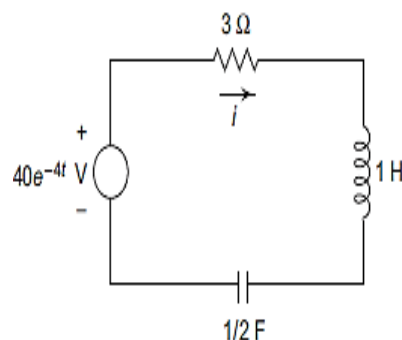


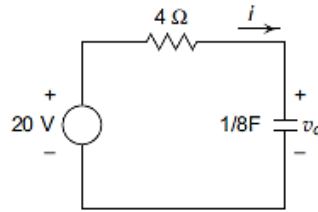
**Instructions to the Students:**

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
<b>Q. 1 Solve Any Two of the following.</b>		<b>12</b>
A) Write the mesh equations for the circuit shown in Fig. and determine the currents, $I_1$ , $I_2$ and $I_3$ .	<b>CO1</b>	<b>6</b>
B) State Superposition Theorem. Find the voltage across the 2 Ω resistor in Fig. shown by using the super-position theorem.	<b>CO1</b>	<b>6</b>
C) Explain KCL and KVL with Example	<b>CO1</b>	<b>6</b>
<b>Q.2 Solve Any Two of the following.</b>		<b>12</b>
A) Explain Circuit elements in the s-domain	<b>CO1, CO3</b>	<b>6</b>
B) Determine the current $i$ if the circuit is driven by a voltage source as shown in Fig. The initial value of the voltage across the capacitor and the initial current through the inductor are both zero.	<b>CO1, CO3</b>	<b>6</b>

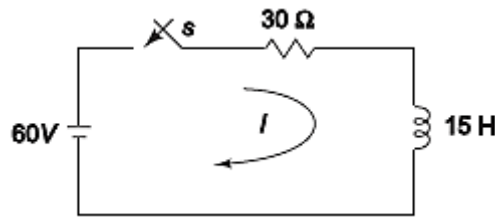


- C) Determine the current  $i$  for  $t \geq 0$  if  $V_c(0) = 4$  V for the circuit shown in Fig. CO1, CO3 6

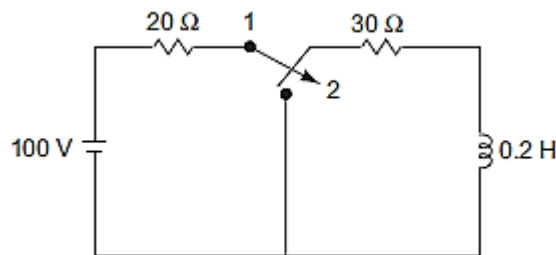


**Q. 3 Solve Any Two of the following.** 12

- A) A series RL circuit with  $R = 30$  W and  $L = 15$  H has a constant voltage,  $V = 60$  V applied at  $t = 0$  as shown in Fig. Determine the current  $i$ , the voltage across resistor and the voltage across the inductor. CO1, CO3 6

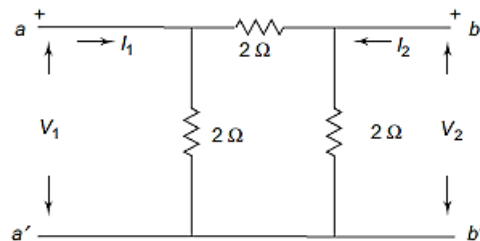


- B) Derive an Expression for DC response in an R-C circuit CO1, CO3 6
- C) For the circuit shown in Fig, find the current equation when the switch is changed from position 1 to position 2 at  $t = 0$ . CO1 6

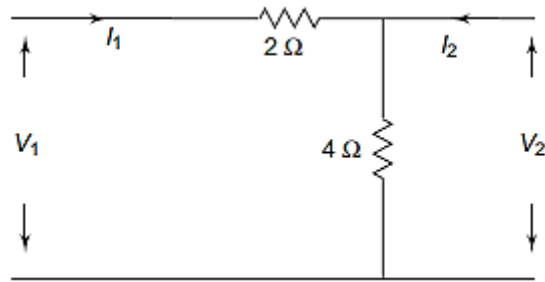


**Q.4 Solve Any Two of the following.** 12

- A) Find the transmission parameters for the circuit shown in CO1, CO4 6



- B) Find h parameters for the network in Fig CO1, CO4 6



C) In a two-port bilateral network show that  $AD - BC = 1$  CO1, CO4 6

**Q. 5 Solve Any Two of the following.** 12

A) Obtain the incidence matrix A from the following reduced incidence matrix  $A_1$  and draw its graph. CO1 6

$$[A_1] = \begin{bmatrix} -1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & -1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & -1 & 1 & 0 \\ 0 & 0 & -1 & 0 & 0 & -1 & 1 \end{bmatrix}$$

B) Write Laplace transform of some standard Network Functions. CO1 6

C) Obtain first form of foster network for the driving point impedance of LC Network given as CO1, CO3 6

$$Z(s) = 10(s^2+4)(s^2+16) / s(s^2+9)$$

\*\*\* End \*\*\*