DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Branch : Electronics and Telecommunication/ Electronics and Telecommunication (Sandwich) Engineering Semester : IV

Course: B. Tech. Subject Code & Name: BTETC401(Network Theory)

Max Marks: 60 Date: 12/08/2022 **Duration: 3.45 Hr.**

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.
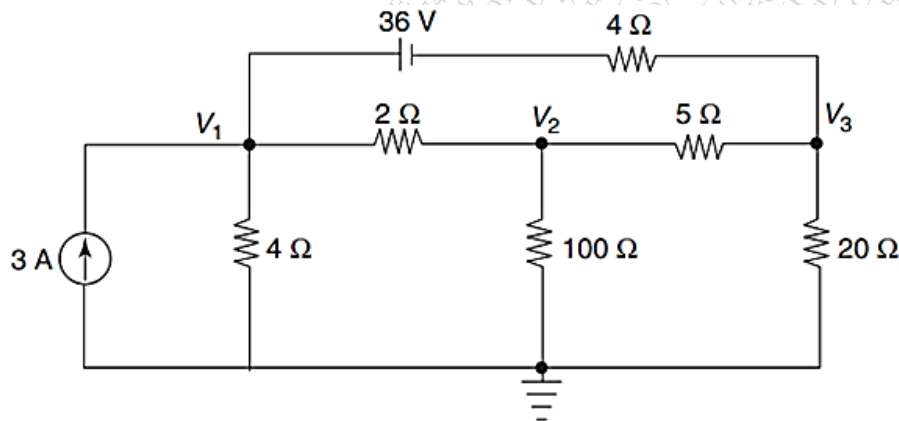4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks

Q. 1 Solve Any Two of the following.

A) For the network shown, find voltages V_1 and V_2 using Node Analysis | CO1 | 6
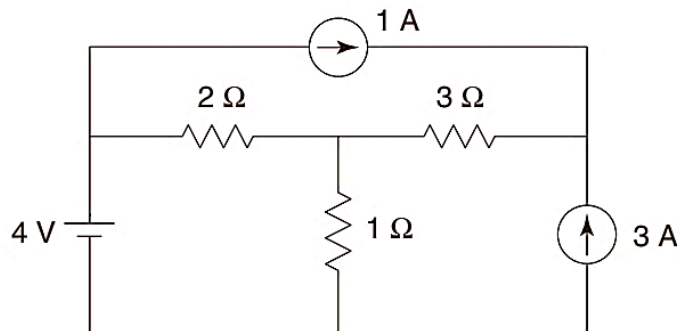

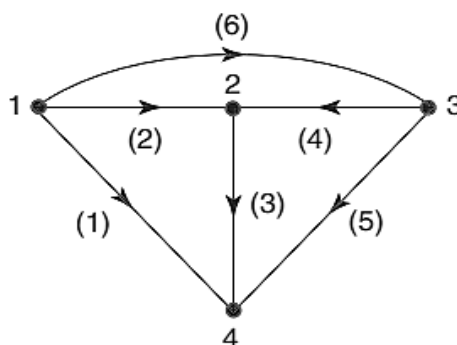**B)** State Superposition theorem and Find the current in the 1 Ω resistors | CO1 | 6

C) Define the terms : Branch and Node related to graph of a network and For the graph shown below write the (a) incidence matrix (b) Tie set matrix | CO1 | 6
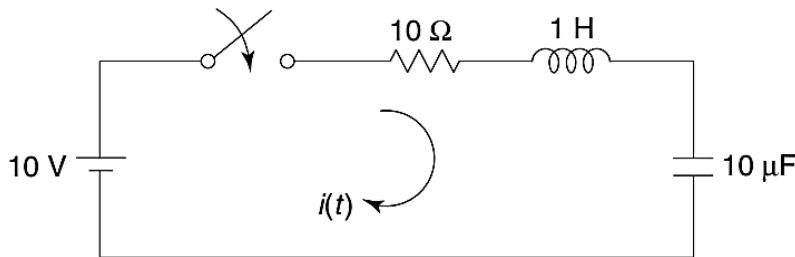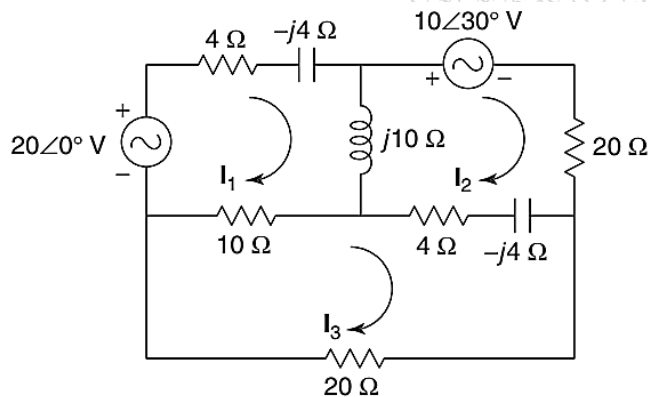
Q.2 Solve Any Two of the following.

A) In the given network of Fig., the switch is closed . Assuming all Initial conditions as zero, find i, di/dt and d^2i/dt^2 at $t = 0^+$.   **CO1, CO3**   **6**
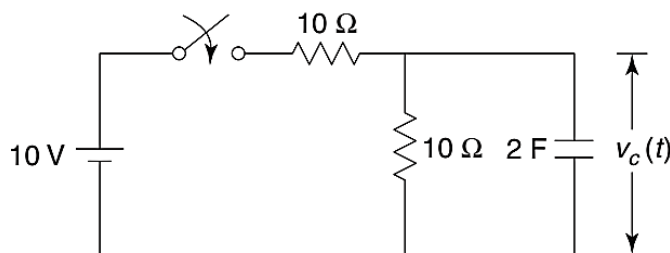

B) Find the value of the current I_3 in the network shown   **CO1, CO3**   **6**

C) What are initial conditions? Explain the initial conditions for Resistor, capacitor and inductor   **CO1, CO3**   **6**
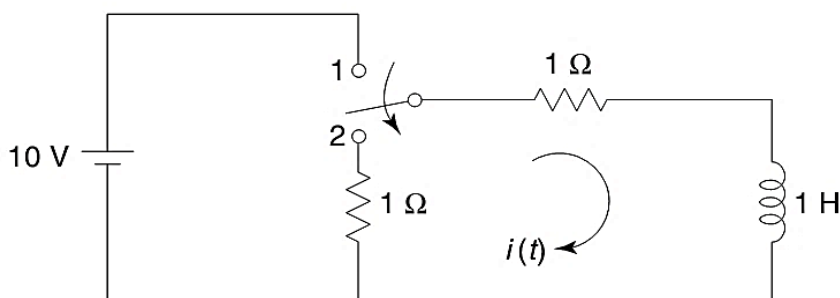
Q. 3 Solve Any Two of the following.

A) The switch in the network shown below switch is closed at t = 0. Determine the voltage across Capacitor   **CO1**   **6**
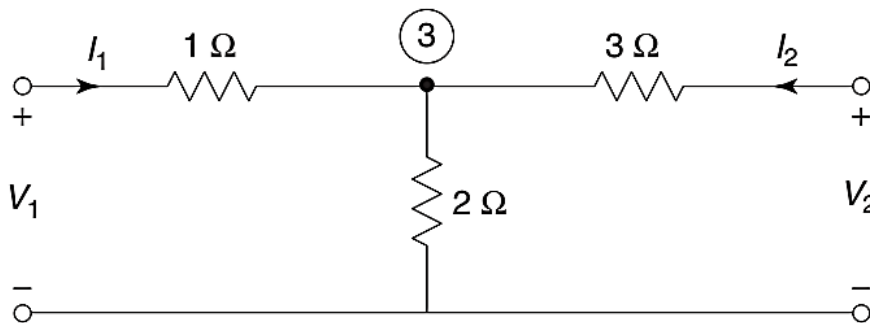

B) Explain the Behaviour of basic elements in Laplace Transform   **CO1**   **6**

C) In the network of Fig. given below , the switch is moved from the position 1 to 2 at t = 0,steady-state condition having been established in the position 1. Determine i (t) for t > 0.   **CO1**   **6**

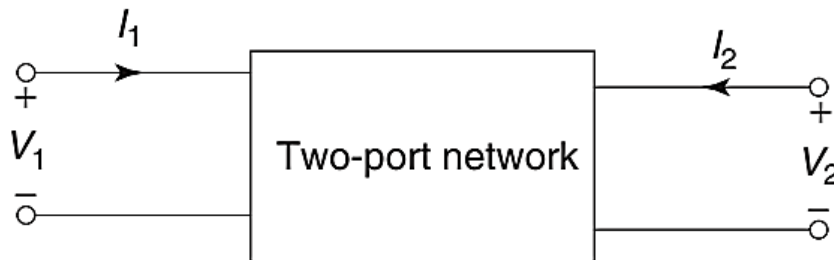**Q.4** **Solve Any Two of the following.**

A) Derive Y-parameter in terms of h-parameter and ABCD parameter **CO1, CO4** **6**

B) Find Y-parameters for the network shown. Determine whether the network is symmetrical and reciprocal **CO1, CO4** **6**

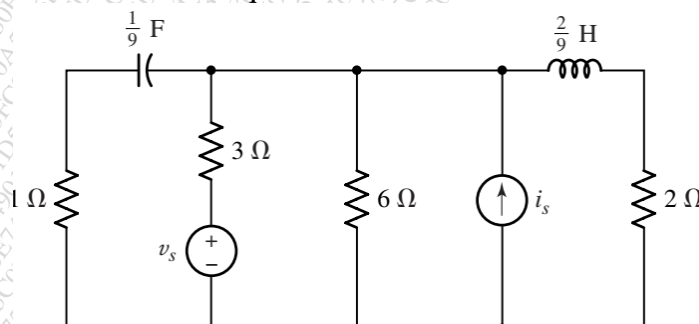**C)** Define the terms: Transfer Impedance Function and Transfer Admittance Function. **CO1, CO4** **6**

In the two-port network shown below, compute h-parameters from the following data:

(a) With the output port short-circuited: $V_1=25V$, $I_1=1A$, $I_2=2A$

(b) With the input port open-circuited: $V_1=10V$, $V_2=50V$, $I_2=2A$

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

A) Realise Cauer forms of the following LC impedance function. **CO1, CO3** **6**

$$Z(s) = \frac{10S^4 + 12S^2 + 1}{2S^3 + 2S}$$

B) Write a set of normal-form equations for the circuit **CO1, CO3** **6**

C) Explain about Propagation constant and Characteristic impedance in Π-network filters. **CO1, CO3** **6**

*** End ***