

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:

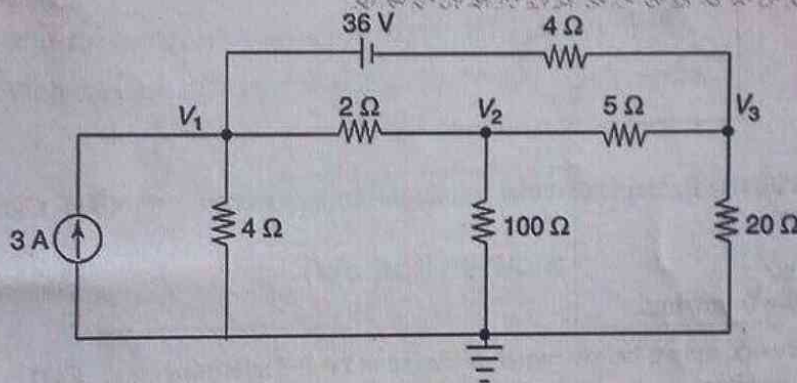
1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and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

(Level/CO) Marks

Q.1 Solve Any Two of the following.

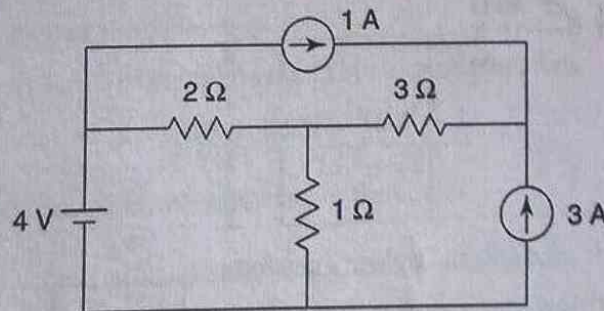
A) For the network shown, find voltages V_1 and V_2 using Node Analysis

CO1 6



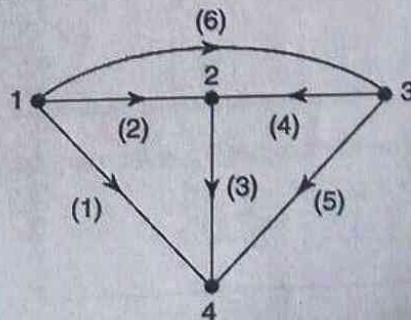
B) State Superposition theorem and Find the current in the $1\ \Omega$ resistors

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

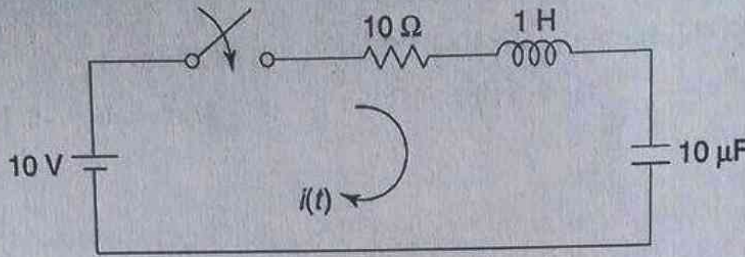
CO1 6



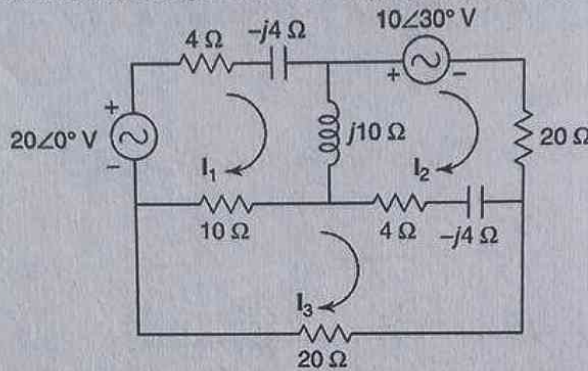
42FD6A1618EAFE0978290F108F0554C6

Q.2 Solve Any Two of the following.

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



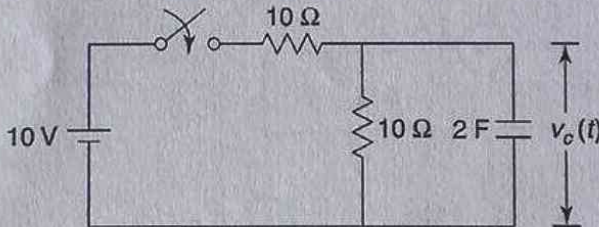
- B) Find the value of the current I_3 in the network shown CO1, CO3 6



- C) What are initial conditions? Explain the initial conditions for Resistor, CO1, CO3 6 capacitor and inductor.

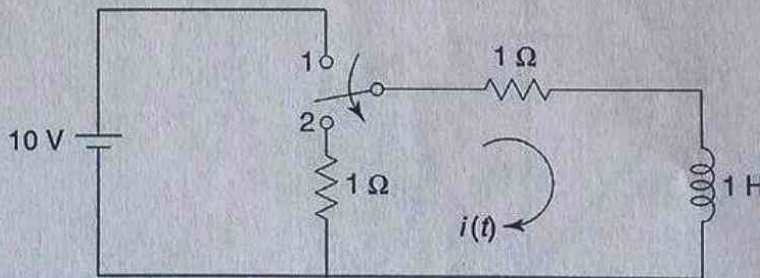
Q.3 Solve Any Two of the following.

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



- 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



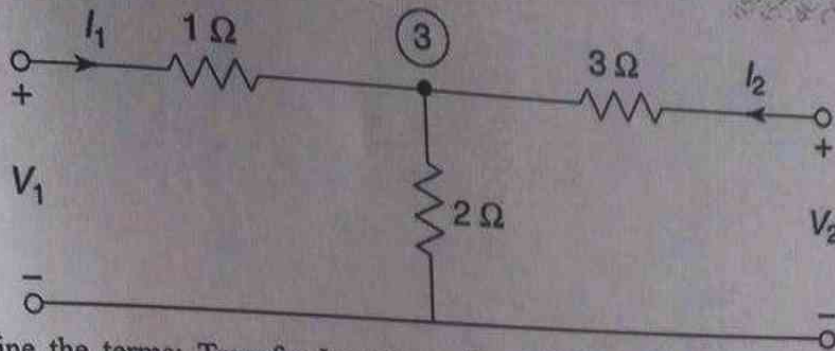
Q.4 Solve Any Two of the following.

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

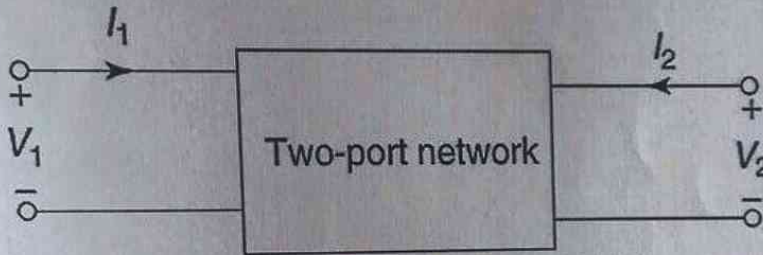


C) Define the terms: Transfer Impedance Function and Transfer Admittance Function.

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.

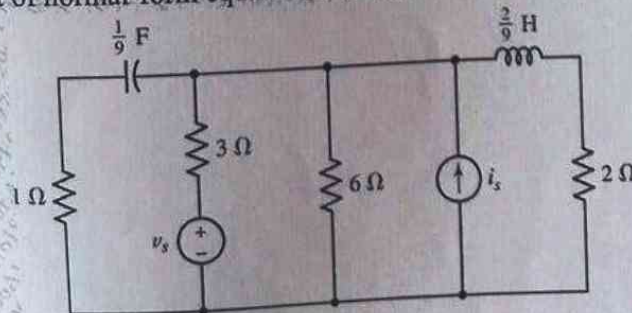
A) Realise Cauer forms of the following LC impedance function.

CO1, CO3 6

$$Z(s) = \frac{10s^4 + 12s^2 + 1}{25s^3 + 25s}$$

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 ***