Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Network Analysis **Semester: III**
Program: B. Tech- ECE **Time: 03 hrs.**
Course Code: ECEG -2020 **Max. Marks: 100**

Instructions: (i) Attempt all the sections.

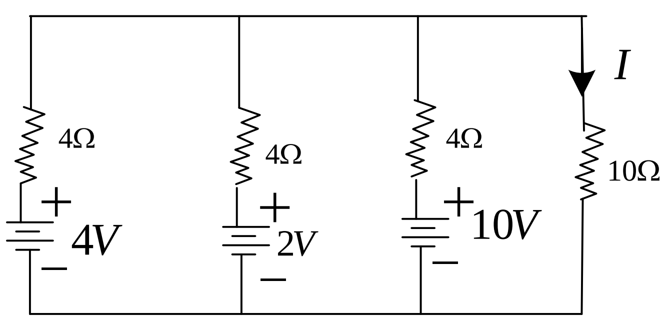
SECTION-A (20 Marks)

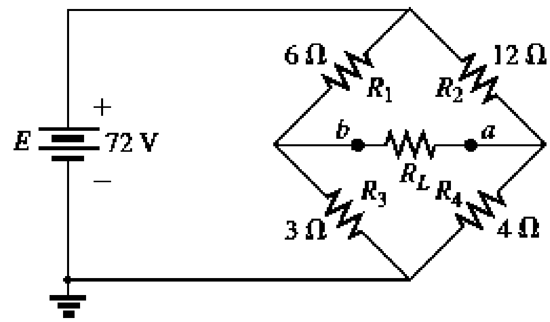
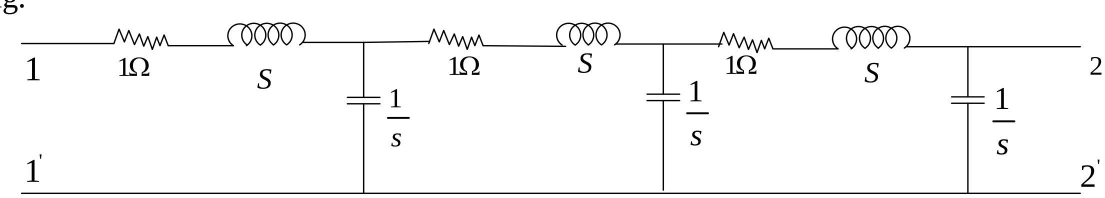
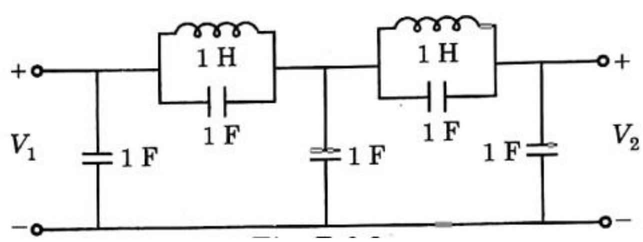
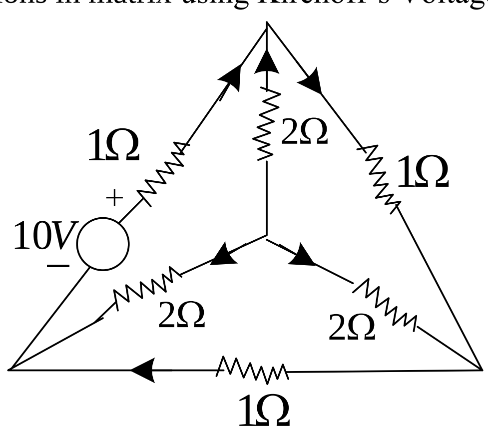
Each Question will carry 4 Marks
Instruction: Write briefly (5-6 lines)

S. No		**CO**
Q 1	What are the open circuit impedance parameters of a two-port network? Why are they so called?	**CO2**
Q 2	Briefly define for: (i) Rank of Graph (ii) Planner Graph (iii) Tree (iv) Twig	**CO3**
Q 3	Explain minimum two properties of Hurwitz polynomial.	**CO4**
Q 4	Define Y-parameters. Determine the relationship between the Z and Y parameters.	**CO2**
Q 5	Define (i) Transfer impedance function (ii) Current transfer function	**CO3**

SECTION-B (40 Marks)

Each question will carry 10 marks
Instruction: Attempt all the questions

Q 1	Determine the load current using Millman's theorem. Network shown in Figure. 	**CO1**
Q 2	Find the Thevenin's equivalent circuit for the electrical circuit given in the bridge network as,	**CO1**

		
Q 3	Find the open circuit driving point impedance at terminals 1-1′ of the ladder work shown in Fig.  **OR** For the given network circuit, calculate the voltage ratio transfer function 	**CO3**
Q 4	**Attempt both the parts:** **(a)** With reference to Figure, draw the graph and write down the tie-set matrix. Obtain the network equilibrium equations in matrix using Kirchoff's Voltage Law (KVL).  **(b)** Incidence matrix of a graph is given below. Draw the directed graph:	**CO4 (5+5)**

$$\begin{array}{c|ccccccc} \text{Nodes} \downarrow \backslash \text{Branches} \rightarrow & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ \hline (1) & -1 & 0 & -1 & 1 & 0 & 0 & 1 \\ (2) & 0 & -1 & 0 & -1 & 0 & -1 & 0 \\ (3) & 1 & 1 & 0 & 0 & -1 & 1 & 0 \\ (4) & 0 & 0 & 1 & 0 & 1 & 0 & -1 \end{array}$$

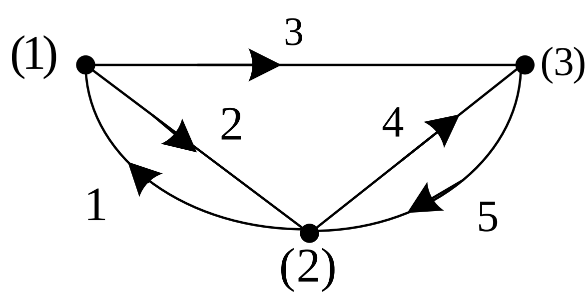
SECTION-C **(40 Marks)**

Each Question carries 20 Marks.
Instruction: Write long answer.

Q 1 **Attempt both the parts:**

(a) Design all the possible trees. Also, determine the incidence matrix for the given graph. **CO4**

(10+5+5)

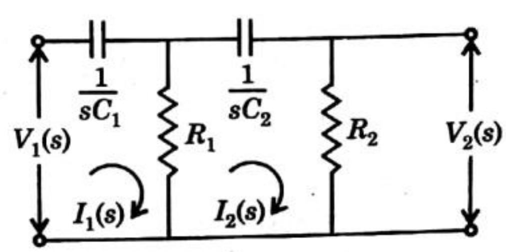


(b) Show the function $F(s)=\dfrac{(s+2)(s+4)}{(s+1)(s+3)}$ is positive real function or not?

(c) Check whether the given polynomial $P(s)=S^4+S^3+2S^2+4S+1$ is Hurwitz or not?

Q-2 Find the expression of voltage transfer function $G_{21}(s)=\dfrac{V_2(s)}{V_1(s)}$ for the network shown in Figure **CO3**

(20)



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