Name:

Enrolment No:

UPES
UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2020

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

Instructions: (i) Answer all the questions.

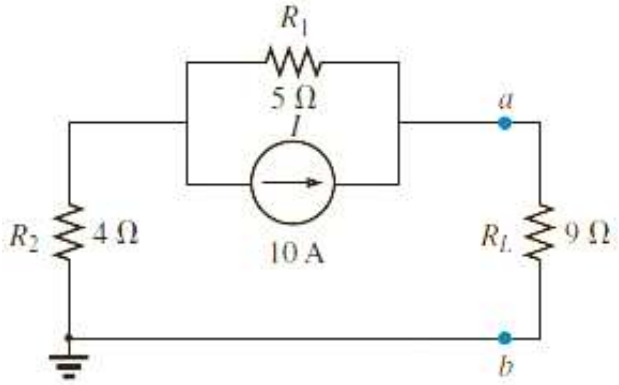
SECTION A (30 Marks)

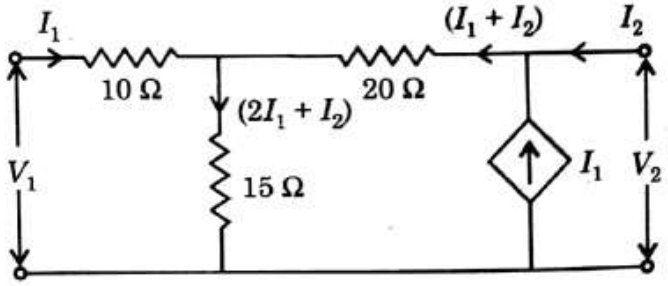
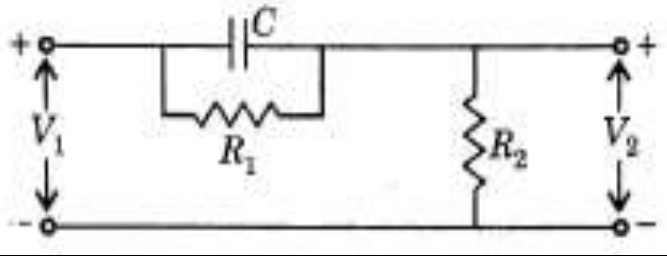
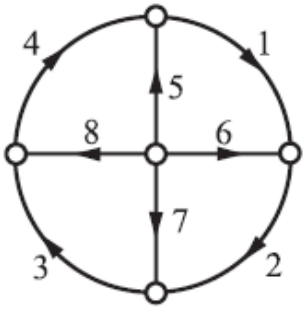
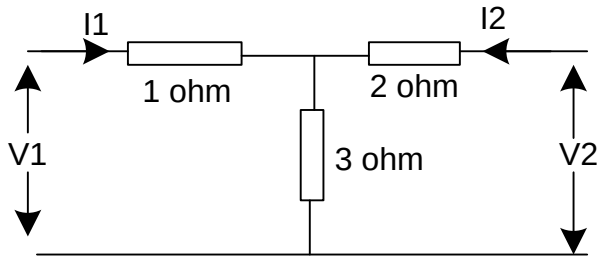
Each Question will carry 5 Marks
Instruction: Write briefly (5-6 lines)

S. No		CO
Q 1	What do you mean by two-port network systems and differentiate two-port and one-port network systems? Explain with appropriate applications.	CO2
Q 2	Briefly define for: (i) Graph (ii) Node (iii) Tree	CO3
Q 3	Define Hurwitz polynomial and write its properties.	CO4
Q 4	Explain the duality property of Thevenin's and Norton's theorem. Also write a statement of Thevenin's theorem.	CO1
Q 5	Explain the condition of Reciprocity and symmetry two-port network system with the significance also.	CO2
Q 6	Write the necessary conditions for transfer functions. Differentiate the impedance transfer function and admittance functions.	CO3

SECTION B (50 Marks)

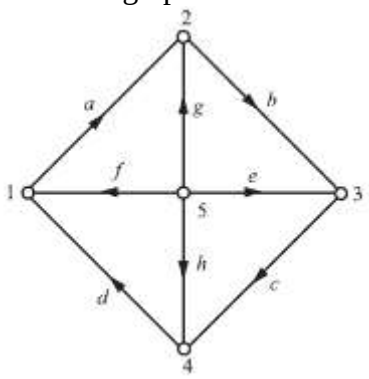
Each question will carry 10 marks
Instruction: Attempt all the questions

Q 1	Find the Norton equivalent circuit for the network external to the 9Ω resistor in Figure. 	CO1

Q 2	Determine the Z-parameters of network shown in Figure.  	**CO2**
Q 3	Find driving point impedance $Z_{11}(s)$ and voltage transfer function $G_{21}(S)= \frac{V_2(s)}{V_1(s)}$ of the given network circuit.  	**CO3**
Q 4	**Attempt both the parts** (a) Determine Tie-set matrix of the give directed graph of electrical network.  **(b)** Check the whether the given polynomial function are Hurwitz or not? $P(s) = s^4 + s^3 + 5s^2 + 3s + 4$	**CO4**
Q 5	For the network shown in figure. Calculate (i) Z parameters (ii) Y parameters  	**CO2**

SECTION-C

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

Q 1	**Attempt both the parts:** **(a)** Design all the possible trees and verity the number of tree using mathematical analysis. Also, determine the incidence matrix for graph.  **(b)** An impedance function is given by $$Z(s) = \frac{(s+4)(s+6)}{(s+3)(s+5)}$$ Design the one port R-C representation of circuit for (i) Cauer-I (ii) Cauer- II forms.	**CO4** **(10+10)**

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