

Roll No.:.....

# National Institute of Technology, Delhi

Name of the Examination: B.Tech.

Re-Mid Semester Examination (Autumn, 2023)

Branch : ECE Semester : III  
 Title of the Course : Network Analysis and Synthesis Course Code : ECLB202  
 Time: 1 Hour 30 Minutes Maximum Marks: 25

Note: All questions are compulsory.

COURSE OUTCOMES		COGNITIVE LEVELS
CO1	To understand the various laws and theorems related to electric networks.	Knowledge/Comprehension (Level I/ II)
CO2	To apply the graph theory and network theorems in circuit analysis.	Application (Level III)
CO3	To analyze and evaluate the networks in transformed domain.	Analysis/Evaluation (Level IV/VI)
CO4	To analyze and synthesize the two port network functions.	Analysis/Synthesis (Level IV/VI)

Course Outcomes (CO's)	CO1	CO2
Questions No.	Q1, Q2	Q3, Q4, Q5 & Q6

Answer the following questions.

- Q1. State Norton's theorem and Milman's theorem. Also, give an example circuit in each case showing that it follows the theorem. [3Marks]
- Q2. For the circuit shown in Fig. 1, find  $V_{Th}$  and  $I_N$  across the terminal A and B. [3 Marks]
- Q3. Determine the voltage  $V_x$  and power supplied by the 1A source in the circuit shown in Fig. 2. [4 Marks]

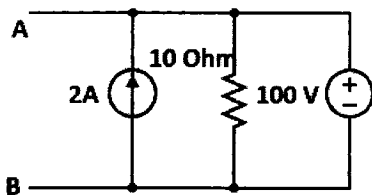


Fig. 1

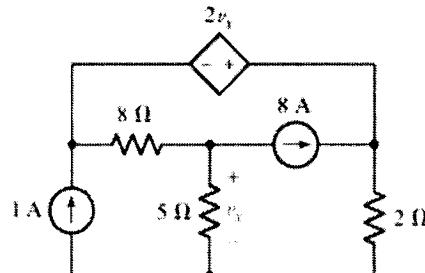
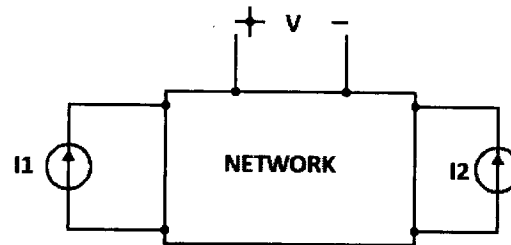


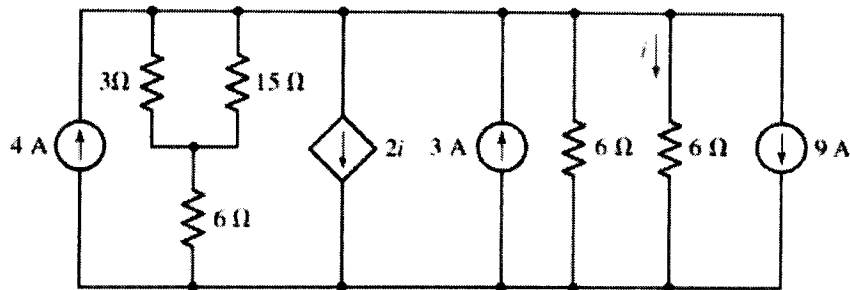
Fig. 2

- Q4** The linear network as shown in Fig. 3 has only resistors. If  $I_1 = 8\text{A}$  and  $I_2 = 12\text{A}$ ;  $V$  is found to be  $80\text{V}$ .  $V=0$  when  $I_1 = -8\text{A}$  and  $I_2=4\text{A}$ . What is the value of  $V$  when  $I_1=I_2=10\text{A}$ ? **[5 Marks]**



**Fig. 3**

- Q5.** (a) In a network, the resistance  $R1$  is in series with the transform impedance  $1/Cs$ . Find the transfer function. **[5 Marks]**  
 (b) Define transfer function. What are the restrictions on the location of poles and zeros of transfer function for output/input?
- Q6.** Calculate the power absorbed by the  $15\Omega$  resistor in the circuit shown in Fig.3. **[5 Marks]**



**Fig. 4**