United International University **(UIU)**

Dept. of Computer Science & Engineering **(CSE)**

Final Exam, Trimester: Fall 2023

Course Code: CSE 113/EEE 2113**; Course Title:** Electrical Circuits

Total Marks: 40**; Duration:** 2 hours

Any examinee found adopting unfair means would be expelled from the trimester/ program as per UIU disciplinary rules.

Question 1: Answer all the questions. (10 Marks)

Answer the following questions for the circuit shown in **Figure** 1: [2+2+6]

i)Draw the circuit with the Independent Current Source Turned Off. ii)Draw the circuit with the Independent Voltage Source Turned Off. iii)Apply the Superposition Theorem, and find the value of I_R.

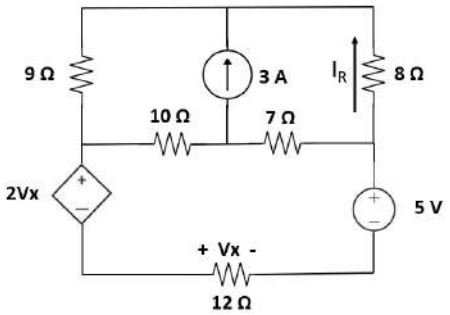

Figure 1.

Question 2: Answer all the questions. (10 Marks)

For the circuit shown in **Figure 2**, answer the following questions: [6+2+2]

i) Determine the Thevenin equivalent circuit at the A-B terminal.

ii) For any value of R_L, what will be the maximum power delivered to this resistance?

iii) If R_L=1kΩ, then would maximum power be achieved? If not, then what should you do to achieve maximum power?

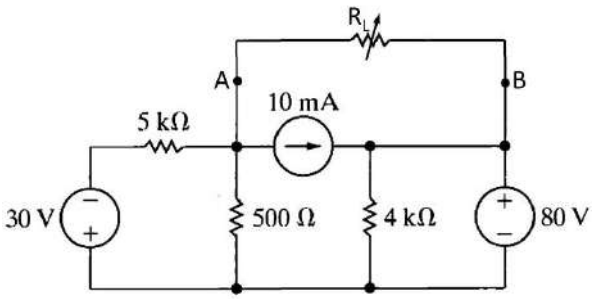

Figure 2.

Question 3: Answer all the questions (10 Marks)

Answer the following questions for the circuit shown in **Figure 3**: [3+2+3+2]

i)Determine Z_T. ii) Current, I. iii) Find the currents through 4 Ω and 3 Ω resistors.

iv) Is the source voltage or the current, I leading in this circuit?

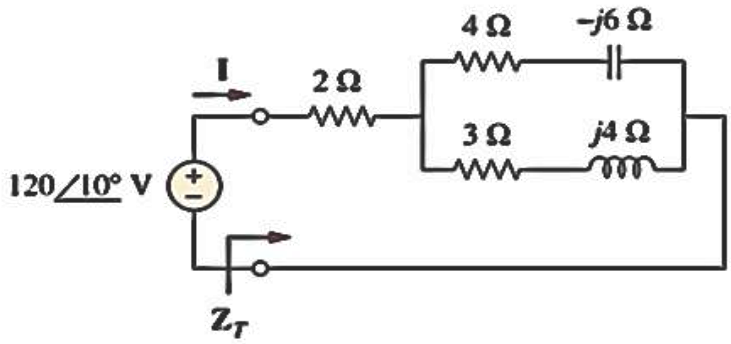

Figure 3.

Question 4: Answer all the questions. (10 Marks)

For the circuit shown in **Figure 4a**, determine I_m if the rms value of such current is 5A. Now, determine i_o and average real power absorbed by a 3-ohm resistor using **CDR** in the circuit shown in **Figure 4b** if the angular frequency is 100 rad/s in the circuit. [6+2 +2]

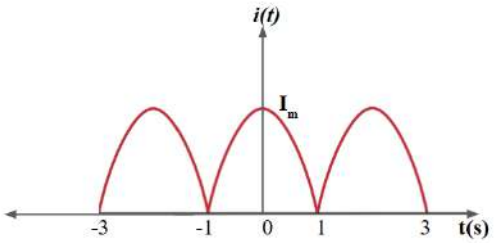

Figure 4a.

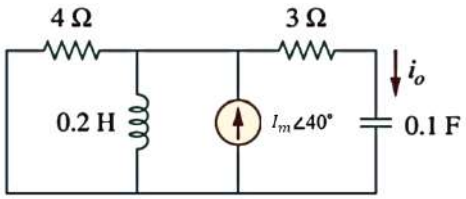

Figure 4b.