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.

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| **Question 1: Answer all the questions. (10 Marks)** |  |
| Answer the following questions for the circuit shown in **Figure** 1: | [2+2+ |
| i)Draw the circuit with the Independent Current Source Turned Off. ii)Draw the circuit | 6] |
| with the Independent Voltage Source Turned Off. iii)Apply the Superposition Theorem, |  |
| and find the value of 𝐼𝑅. |  |
| **Figure 1.** |  |
| **Question 2: Answer all the questions. (10 Marks)** |  |
| For the circuit shown in **Figure 2**, answer the following questions: | [6+2+ |
| i) Determine the Thevenin equivalent circuit at the A-B terminal. | 2] |
| ii) For any value of 𝑅𝐿, what will be the maximum power delivered to this resistance? |  |
| iii) If 𝑅𝐿=1kΩ, then would maximum power be achieved? If not, then what should you |  |
| do to achieve maximum power? |  |
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| **Figure 2.** |  |

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| **Question 3: Answer all the questions** | **(10 Marks)** |  |
| Answer the following questions for the circuit shown in **Figure 3**:  i)Determine 𝑍𝑇. 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? | | [3+2+  3+2] |
| **Figure 3.** | |  |
| **Question 4: Answer all the questions.** | **(10 Marks)** |  |
| For the circuit shown in **Figure 4a**, determine 𝐼𝑚 if the rms value of such current is 5A. | | [6+2+ |
| Now, determine 𝑖𝑜 and average real power absorbed by a 3-ohm resistor using **CDR** in the | | 2] |
| circuit shown in **Figure 4b** if the angular frequency is 100 rad/s in the circuit. | |  |
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| **Figure 4a.** | |  |
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| **Figure 4b.** | |  |