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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Spring 2026
Course Code: CSE112 , Course Title: Computer Fundamentals
Level:1 Term:1 Batch: 71

Time: 01:30 Hrs **Marks: 25**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	*a)*	A student is working on a computer lab assignment using a desktop computer. While writing and running the program, the program instructions, variables, and intermediate calculation results are stored in a fast memory so the CPU can access them quickly. However, when the student saves the completed assignment and shuts down the computer, the data is stored in another type of memory that keeps the information safe even when the power is turned off. In the above scenario, identify: **i)** Identify the appropriate storage device that is used to hold running programs and intermediate results. **ii)** Identify the appropriate storage device that retains a saved assignment even after the power is turned off.	1+1	CO1
	b)	Simplify the following function: (A+C)(AD+AD')+AC+C	3	
	c)	Build the circuit diagram of the following function using NAND gate(s) only: F(A,B,C) = AB' + BC' You cannot simplify the function. Just implement whatever is given in the question.	3	
	d)	During Eid shopping, a family purchases several items: • New clothes cost $(214)_5$ taka in total. • Shoes cost $(145.6)_7$ taka in total. • Eid gifts cost $(132)_6$ taka in total. Before shopping, the family had $(13210)_4$ taka saved.How much money will remain after all Eid shopping expenses? Show your final answer in decimal (base 10).	4	
2.	*a)*	Explain how ethical guidelines and best practices can be applied to mitigate risks in AI systems.	4	CO2
	b)	A university student is preparing a research report and a seminar presentation on **"Climate Change and Its Global Impact."**	1+3=4	

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		Initially, the student writes the report individually using Microsoft Word, taking advantage of its advanced formatting tools, citation management, and offline access. Later, when collaboration with group members becomes necessary, the team shifts the document to Google Docs to enable real-time editing, commenting, and instant sharing. At the same time, the student prepares a presentation using Microsoft PowerPoint. To enhance visual quality, the student generates custom images using AI tools such as Grok. However, unclear prompts produce inaccurate images. The student then learns to write clear and structured prompts, understanding the importance of prompt engineering in generating relevant AI content. **i)** Compare Microsoft Word and Google Docs based on the scenario. Give one difference. **ii)** Explain the importance of prompt engineering in the modern era.		
3.		A company is building a smart vacuum cleaner that can clean rooms automatically. At first, the engineers test the vacuum cleaner in a small training room where the layout of the room is already known. They know where the walls are, what happens when the vacuum moves left or right, and how much reward is given for cleaning a dirty area. Later, the vacuum cleaner is used in real homes, where the layout is unknown. The vacuum cleaner must learn by moving around, hitting obstacles, and receiving feedback without knowing the rules of the environment beforehand. To train the vacuum cleaner, the engineers use reinforcement learning algorithms. **i)** Classify the main types of machine learning? **ii)** Identify the suitable type of reinforcement learning that should be applied when the room layout and rules are already known. Choose and name one suitable algorithm for this situation. **iii)** Identify the suitable type of reinforcement learning that should be applied when the vacuum cleaner learns only from experience in unknown real homes. Choose and name one appropriate algorithm.	1+2+2 = 5	CO3