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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Midterm Examination, Summer 2026

Course Code: CSE112 , Course Title: Computer Fundamentals

Level:1 Term:1 Batch: 72

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)***	Indicate the differences between system and application softwares.	3	**CO1**
	b)	Draw the basic structure of a computer system	2	
	c)	Convert $(23230.3)_4$ to Base-6.	2.5+2.5	
	d)	Divide $(201543)_6$ by $(143)_6$	3	
	e)	Draw the circuit diagram of the following function using NAND gates only. $F(A,B,C) = (A'BC + A)'$ You cannot simplify the function. Just implement whatever is given in the question.	4	
2.	***a)***	A global tech company is launching an AI-powered recruitment tool to screen job applications. • **Part A:** During testing, the company discovers the AI is automatically rejecting highly qualified female candidates because the historical data used to train it mostly featured men. • **Part B:** The tool is also found to be accessing the private, unencrypted personal messages of applicants on their phones to "better understand their personality" without their knowledge. • **Part C:** To address these concerns, the company decides to follow a set of formal principles and conduct frequent checks on the AI's data and results. i) Identify the two specific ethical issues illustrated in Part A and Part B. ii) Name two "Best Practices" or "Guidelines" that the company can use to mitigate these ethical risks.	1+2	**CO2**

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	b)	A healthcare company is working on two machine learning projects for medical data analysis. In the first project, the company has a large dataset containing patient records where each record is labeled as either "Diabetic" or "Non-Diabetic." The goal is to train a model that can predict whether a new patient has diabetes based on features such as age, weight, blood pressure, and glucose level. In the second project, the company has a large collection of patient records without any labels. The company wants to discover hidden patterns and group patients with similar health characteristics to identify potential risk categories. To achieve these goals, the company uses machine learning techniques. i) Classify the main types of machine learning. ii) Identify the most suitable type of machine learning for the first project where patient records are labeled. Justify your answer. iii) Name one appropriate algorithm that can be used for the first project. iv) Identify the most suitable type of machine learning for the second project where patient records are unlabeled. Justify your answer. v) Name one appropriate algorithm that can be used for the second project.	5	