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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Mid Examination, Summer 2025

Course Code: CSE112 , Course Title: Computer Fundamentals

Level:1 Term:1 Batch: 69

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)	Divide $(321230)_4$ by $(123)_4$. Show the whole process.	2	CO1
	b)	A construction project has three phases. Phase 1 costs $(2203)_4$ dollars, while Phase 2 costs $(124.2)_8$ dollars. Phase 3 has been operating for $(110)_5$ days, each day costs $(5.43)_6$ dollars. How much more money will be needed for Phase 3 to match the total cost of Phases 1 and 2 combined? (Show the answer in decimal, show the conversion procedures in detail)	5	
	c)	Draw the circuit diagram of the following function using required logic gates: F(A,B,C) = (AB'C' + AC + (B+C'))	2	
	d)	You are tasked with assigning appropriate processing units to two different computational tasks: • **Task A:** A real-time fraud detection system that processes one transaction at a time and must respond within milliseconds. • **Task B:** A data mining operation that analyzes billions of social media posts simultaneously to detect emerging trends. You have access to both high-performance **CPUs** and **GPUs**. I. Identify which task is better suited for a **CPU** and which for a **GPU**. II. Justify your choices by comparing the capabilities of CPUs and GPUs in terms of: 1. Primary Function and Core Count 2. Memory Access and Task Optimization	1+2	
2.	a)	A major hospital has implemented an AI system to help doctors prioritize emergency patients based on urgency. The system uses historical patient data to predict which cases need immediate attention. After several months, concerns arise that the AI may be giving lower urgency scores to certain groups of patients based on race or income level. Additionally, patients were not informed that an AI system was part of their diagnosis process. **i)** What ethical issues are present in this scenario, and how might they impact patient care?	2+2+2	CO2

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		ii) How can bias in the training data lead to unfair treatment in AI-driven healthcare decisions? iii) What steps should the hospital take to ensure the AI system is used ethically, with fairness, transparency, and patient consent in mind?		
	b)	Digital collaboration is the process of working together with others using digital tools and technologies. How can you use Google Doc as a digital collaboration platform?	2	
3.		Suppose you have three friends, Tanjim, Raisa, and Arif, working on different projects related to a smart campus: • Tanjim is building a model that predicts student grades using labeled data such as attendance and past scores. • Raisa is analyzing campus Wi-Fi data to find patterns in student movement across different areas without any labeled outcomes. • Arif is developing a system where a campus robot learns to navigate efficiently by interacting with its environment, receiving feedback based on its actions. I. Identify the type of machine learning each friend is using. II. Compare these three machine learning approaches based on the type of data they use, the features they consider, and their main objectives. III. Suggest one real-life application of each type of machine learning in a smart campus.	1.5+2 +1.5	CO3