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Daffodil International University

Faculty of Science & Information Technology

Department of Computer Science & Engineering

Midterm Examination, Fall 2025

Course Code: CSE112 , Course Title: Computer Fundamentals

Level:1 Term:1 Batch: 70

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)***	Multiply $(3457)_9$ with $(16)_9$ using base 9.	**2**	**CO1**
	b)	Implement the logic circuit of the following function using NOR gates only: F(A, B, C)= AB' + BC'	**3**	
	c)	A company named **WowTech** is developing an online learning platform following the five stages of the Software Development Life Cycle (SDLC). Based on the scenario, answer in one line what each person's key role would be in their stage of the SDLC. **i)** What will the Product Owner do during the Requirement Analysis phase? **ii)** What will the Back-end Developer build during development? **iii)** During Deployment, what will the DevOps Engineer handle?	**3**	
	d)	A research laboratory named **ReLab** purchases three types of equipment: Monitors cost $(2312)_4$ dollars in total. Keyboards cost $(312.5)_8$ dollars in total. Speakers cost $(144)_5$ dollars in total. Before all purchases, the lab received a grant of $(1021)_3$ dollars. How much money will remain after paying for all three types of equipment? Provide your final answer in decimal form (base 10).	**4**	
2.	***a)***	A company named **Urao** has developed an AI system to help organizations select job applicants. The system analyzes CVs and automatically ranks candidates for interviews. After using the system for a few months, the company receives complaints that women and minority candidates are often ranked lower than others, even when they have similar qualifications. Later, it is also discovered that the system stores candidate data — including contact information and work history — without asking for permission. When questioned, the development team says they used old company hiring data to train the AI but never reviewed it for bias.	**2+2+2**	**CO2**

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		i) Which ethical issues are present in this scenario? Explain how they affect fairness and privacy. ii) What steps or guidelines should the company follow to make the AI system more ethical and responsible? iii) If you were part of the AI development team, what regular audits or reviews would you suggest to prevent such problems in the future?		
	b)	A university student named **Sara** is working on her semester project. She starts by analyzing survey responses from her classmates and wants to visualize the results with bar charts. Next, she begins writing her research paper, making sure to include citations in APA style and a table of contents. Once the paper is ready, she prepares a presentation of her findings, embedding charts and adding speaker notes to explain her results clearly. Finally, Sara uses AI to summarize long research articles and generate practice quiz questions to help her study. For each task Sara performs, identify the most appropriate software tool or technique she should use.	0.5x4= 2	
3.		Three students — **Arpita,Abonti** and **Arisha** — are working on different AI projects for their university's smart campus. Each of them is using a different type of unsupervised learning algorithm. • **Arpita** is studying the purchasing records from the campus cafeteria to find which food items are often bought together, in order to recommend meal combinations for students. • **Abonti** is analyzing anonymized library usage logs to group students with similar study habits. • **Arisha** is working with data collected from smart classroom sensors, aiming to simplify large sets of variables so that patterns in classroom occupancy and temperature can be more easily visualized. I. Identify which type of unsupervised learning algorithm each student is using. How is unsupervised learning different from supervised learning? II. Compare these three approaches in terms of their purpose (main goal of the algorithm) and the type of insights or information they reveal from the data.	2+3	CO3