



Daffodil International University
Faculty of Science & Information Technology
Department of Information Technology & Management
Mid Term Examination, Fall 2025

Course Code: ITM 217; Course Title: Data Structure and Algorithms

Section: A; Teacher: FR

Time: 1:30 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)	Explain the concept of Time Complexity and Space Complexity in data structures with suitable examples.	[Marks-5]	CO-1 Level-2
	b)	Differentiate between an Array and a Linked List by comparing their key properties.	[Marks-5]	
2.	a)	Consider the linear arrays AAA(5:50) and BBB(-5:10), where Base(AAA) = 300 and each memory cell holds 4 words for AAA. Calculate the following: i. The total number of elements in arrays AAA and BBB. ii. The memory addresses of AAA[15] and AAA[35].	[Marks-5]	CO-2 Level-3
	b)	A software company organizes its project members into three teams: Development, UI/UX, and Quality Assurance (QA). To manage records efficiently, the company uses a linked list for each team, where each node stores a Member ID and a pointer to the next node. The team members are as follows: - Development team: M01, M04, M07, M10 - UI/UX team: M02, M05, M09 - QA team: M03, M06, M08, M11 Illustrate how the company can represent the three teams using linked lists in memory, showing the nodes and pointers clearly.	[Marks-5]	
3.	a)	Consider the following arithmetic expression P, written in postfix notation: P: 12,7,3,-,/,2,1,5,+,*,+ Calculate the value of the arithmetic expression P (Use a stack to store operands and perform the evaluation step by step.)	[Marks-5]	CO-3 Level-3