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Daffodil International University

Faculty of Science & Information Technology

Department of Information Technology & Management

Mid Term Examination, Fall 2026

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)*	Describe the different types of operations performed on Array Data structure.	[Marks-5]	CLO-1 *Level-2*
	b)	Discuss the following terms with appropriate examples. Explain how each metric is used to evaluate the performance and efficiency of algorithms: I. Time Complexity II. Space Complexity	[Marks-5]	
2.	*a)*	A stack of files in an office tray follows the stack (LIFO) principle and can hold a maximum of N = 8 files. Initially, the stack contains the following file numbers (from bottom to top): Stack: 105, 112, 118, 124, 131, ——, ——, —— Apply the following operations on the stack: 1.PUSH(140) 5.POP(ITEM) 2.PUSH(147) 6.POP(ITEM) 3.PUSH(153) 7.PUSH(166) 4.PUSH(160) 8.POP(ITEM) Instructions • After each operation, clearly show the updated state of the stack. • For every POP operation additionally mention the removed book number. • Clearly indicate the step where stack overflow or stack underflow occurs.	[Marks-4]	CLO-2 *Level-3*