



Daffodil International University
Faculty of Science & Information Technology
Department of Computer Science & Engineering
Midterm Examination, Summer 2026
Course Code: CSE213 , Course Title: Algorithms
Level: 2 Term:1 Batch: 69

Time: 01:30 Hrs

Marks: 25

Answer ALL the 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)	Discuss the trade-off between time complexity and space complexity. <u>Provide examples where increasing memory usage can improve execution time.</u>	02	CO1
	b)	Define and compare Big-O, Big-Ω, and Big-Θ notations. Determine the asymptotic complexity of the following function: $f(n) = 3n^2 + 5n + 10$	03	
2.	a)	Analyze the time and <u>space complexity</u> of Quick Sort. Compare its average case performance with Merge Sort.	02	CO2
	b)	Analyze the time complexity of the following code snippet and express it using asymptotic notation: <pre>#include <stdio.h> int main () { int n; scanf ("%d", &n); int i = 1; while(i <= n) { int j = 1; while(j <= i * i) { printf ("*"); j ++; } i ++; } return 0; }</pre> <pre>#include <stdio.h> int main () { int n; scanf ("%d", &n); for (int i = 1; i < n; i*=3) { for (int j = 1; j < n; j*=3) printf("Got it\n"); } } return 0; }</pre>	1.5*2 = 03	
3.	a)	Design an algorithm for sorting a given set of N integer elements using Insertion sort algorithm and write pseudocode, also analyze its complexity.	05	CO3
	b)	Given coin denominations {2, 5, 10, 15}, design a Greedy algorithm to make change for an amount 118 . Does the greedy strategy work here! Why?	05	
	c)	Construct a Huffman Tree for the following frequencies: a : 5, c : 9, f : 12, i : 13, l : 16, o : 20, s : 25 and u : 32 Show all steps to send the message "fallacious" using the Huffman Tree and compute total cost.	05	