

BANGLADESH UNIVERSITY OF PROFESSIONALS
Military Institute of Science and Technology
B.Sc. in Computer Science and Engineering

Student Group: 36 < Earned Credit Hour <= 72, Final Examination (Spring): Feb 2021

Subject: CSE-203, Data Structures and Algorithms - I

Total: 2.00 hours
Section B: 1.00 hour

Full Marks: 180
Section B : 90

INSTRUCTIONS:

- a. Use **SEPARATE** answer scripts for each section.
- b. **Question – 5 and Question – 8 (Viva Voce)** in **Section B** are compulsory.
- c. Answer any **OTHER ONE** question from this section(From Q - 6 & Q - 7).
- d. Figures in the margin indicate full **marks**.
- e. Assume reasonable data if necessary.
- f. **Symbols** used have their usual meanings.

SECTION-B

Question – 5 (Compulsory)

- a. Given a directed graph G, both BFS and DFS from a particular starting vertex 'S' will transfer the same set of vertices. Do you agree with this statement? Justify your answer. **15**
- b. Simulate binary search algorithm on the array 2, 3, 5, 6, 8, 10, 12, 15, 20, 21, 23 in finding 1, 6, 23, 24 by drawing tables containing values low, high and mid. **15**

Question – 6

- a. Write down the mergesort algorithm. Simulate it using data of Q-5(b). Show the recursion tree formed and label the nodes serially as per order of creation. **15**
- b. Prove how the time complexity of Quicksort algorithm can be achieved better in worst case. Show with simulation. **15**

Question – 7

- a. Give pseudocode of BFS and DFS algorithms. **20**
- b. Compare with the help of a matrix between bubble, insertion, selection, merge and quick sort. It should mention the time complexity and applications. **10**

Question – 8 (Compulsory)

Marks allotted for Viva 30

30