

University of Barishal, Department of Computer Science and Engineering

Course Title: Discrete Mathematics, Course Code: CSE-1203

Exam: Mid Term, Admission Session: 2023-2024

Time: 01 Hour

Marks: 20

1. Define quantifier. Translate: For every person  $x$ , if  $x$  is a student in the class, then  $x$  has visited Dhaka and  $x$  has not visited USA. 4

2. Explain proof technique. Proof the following statement with contradiction and contrapositive technique. 4

"The sum of any two consecutive numbers is odd"

3. Explain the difference between a relation and a function. Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be defined by  $f(x) = 2x + 3$ . Show that  $f$  is one-to-one (injective). 4

4. Using Mathematical induction method show that: 4

$$\sum_{i=0}^{n-1} 2^i(n-i) = 2^{n+1} - n - 2$$

5. How to compute algorithm complexity? Analysis the complexity of Binary Search Algorithm for the following input and search item 13. 4

5	8	11	13	29	35	36	38
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