

## University of Barishal

Dept. of Computer Science and Engineering

Course Code: CSE-1204; Course Title: Discrete Mathematics Lab

Admission Session: 2020-2021; Exam: Lab Final; Marks: 10; Time: 30 minutes

You must write explanation for each question along with answer

N.B: Answer Odd Class Roll = odd question and Even Class Roll = even question

1.	How many ways represent a set?	1
2.	What is cardinality of a set?	1
3.	Prove that $(p \wedge q) \rightarrow (p \vee q)$ is a tautology.	2
4.	The big-O notation for $f(n) = (n \log n + n^2)(n^3 + 2)$ is?	2
5.	If A has 4 elements B has 8 elements, then the minimum and maximum number of elements in $A \cup B$ are _____.	1
6.	For the given Arithmetic progression find the position of first negative term? 50, 47, 44, 41, .....	1
7.	Let $P(n)$ be the statement that postage of $n$ cents can be formed using just 3-cents stamps and 5-cents stamps. Is the statements $P(8)$ and $P(10)$ are Correct?	2
8.	Mrs Smith has twelve different skirts, ten different tops, eight different pairs of shoes, three different necklaces and five different bracelets. In how many ways can Rahima dress up?	2
9.	The number of binary strings of 17 zeros and 8 ones in which no two ones are adjacent is _____.	1
10.	Degree of a graph with 12 vertices is _____.	1
11.	$G$ is a simple undirected graph and some vertices of $G$ are of odd degree. Add a node $n$ to $G$ and make it adjacent to each odd degree vertex of $G$ . The resultant graph is _____.	2
12.	If two cycle graphs $G_m$ and $G_n$ are joined together with a vertex, the number of spanning trees in the new graph is _____.	2
13.	What is the minimum height for a binary search tree with 60 nodes? 59	1
14.	How many edges are there in a complete graph of order 9?	1

Mandatory for all:

What you have learned after completing this course. Write five sentences.



## Practical Part

Time: 01 Hour and 20 Minutes

**N.B: Implement Odd Class Roll = odd problem and Even Class Roll = even problem**

1. Write a program to read two sets (from file) and perform the union operation.

Sample Input (input.txt):  
A=1,2  
B=2,3

Sample Output (output.txt):  
Output=1,2,3

2. Write a program to read two sets (from file) and perform the intersection operation.

Sample Input (input.txt):  
A=1,2  
B=2,3

Sample Output (output.txt):  
Output=2

3. Find power set of a given set A.

Sample Input (input.txt):  
1,2

Sample Output (output.txt):  
Subsets of A = {}, {1}, {2}, {1,2}  
 $|P(A)| = 4$

4. If  $A = \{7, 8\}$  and  $B = \{2, 4, 6\}$ , find  $A \times B$ .

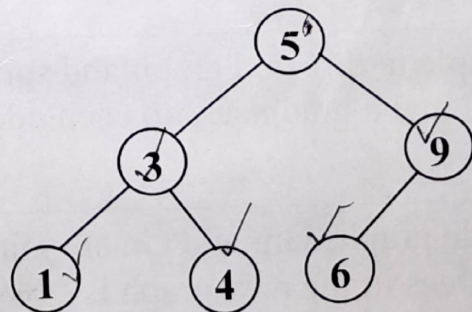
Sample Input (input.txt):  
 $A = \{7, 8\}$      7, 2, 7 4, 7 6  
 $B = \{2, 4, 6\}$      8, 2, 8 4, 8 6

Sample Output (output.txt):  
 $A \times B = \{(7, 2); (7, 4); (7, 6); (8, 2); (8, 4); (8, 6)\}$

5. Given a list of items, construct a binary search tree containing these items.

Sample Input (input.txt):  
5, 3, 1, 9, 6, 4

Sample Output (output.txt):



6. For above binary search tree and an item 9, locate or add this item to the binary search tree.