University of Barishal
Dept. of Computer Science and Engineering
Course Code: CSE-1204; Course Title: Discrete Mathematics Lab

Admission Session: 2021-2022; Exam: Lab Final

You must write explanation for each question along with answer

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

No.	Question	Marks
1.	Two sets are called disjoint if there _____ is the empty set.	1
2.	The complement of the set A is _____.	1
3.	Prove that $(p \wedge q) \rightarrow (p \vee q)$ is a tautology.	2
4.	Discuss the concept of logical equivalence and prove the equivalence of two logical expressions.	2
5.	If A has 4 elements B has 8 elements, then the minimum and maximum number of elements in A U 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.	Rahima 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.	Discuss the concepts of paths and cycles in a graph.	1
10.	Define the terms in Bayes' theorem: P(A|B), P(B|A), P(A), and P(B).	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 Gm and Gn 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 40 nodes?	1
14.	How many edges are there in a complete graph of order 9?	1

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

Sample Input (input.txt):	Sample Output (output.txt):
A = [1,2] B = [2, 3] C = [2, 4, 5]	(A U B) U C = [1, 2, 3, 4, 5]

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

Sample Input (input.txt):	Sample Output (output.txt):
A = {1, 2} B = {2, 3}	A ∩ B = {2}

3.	Find power set of a given set A.

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

4.	If A = {7, 8} and B = {2, 4, 6}, find A × B.

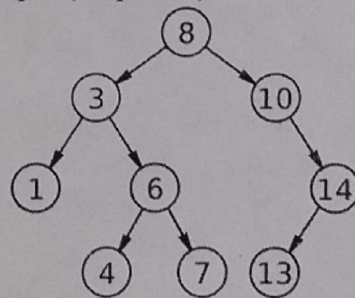| Sample Input (input.txt):	Sample Output (output.txt):
A = {7,8} B = {2,4,6}	A × B = {(7, 2); (7, 4); (7, 6); (8, 2); (8, 4); (8, 6)}

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

Sample Input (input.txt):	Sample Output (output.txt):
1, 3, 4, 6, 7, 8, 10, 13, 14	

6.	For above binary search tree and an item **6**, locate or add this item to the binary search tree.
7.	Mandatory for all: What you have learned after completing this course. Write at least five sentences.