BACHELOR OF COMPUTER APPLICATIONS (CBCS - 2018 COURSE)
B.C.A. Sem-V : WINTER : 2021
SUBJECT: GRAPH THEORY

Day : Saturday
Date : 29-01-2022

W-18790-2021

Time : 10:00 AM-01:00 PM
Max. Marks: 60

N.B.

1) Q.No. 4 from Section I is **COMPULSORY**.
2) Answer **ANY TWO** questions from Q.1,2,3 in Section – I.
3) Answer **ANY TWO** questions from Q.5,6,7 in Section – II.
4) All questions carry **EQUAL** marks.
5) Answer to both the sections should be written in **SAME** answer book.
6) Draw a labeled diagram **WHEREVER** necessary.

SECTION – I

Q.1 Answer the following : **(6 marks x 2 = 12 marks)**

a) Explain the following graphs (any two) with neat diagram
i) Complete graph ii) Path iii) Circuit graph

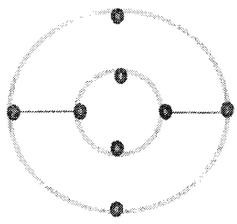
b) Suppose that in a group of 5 people A, B, C, D & E the following parts of people are acquainted with each other
- A & C
- A & D
- B & C
- C & D
- C & E

i) Draw a graph G to represent this situation
ii) List the vertex set and the edge set using set notation.

Q.2 Answer the following : **(6 marks x 2 = 12 marks)**

a) Write and discuss 'Konigsberg Bridge Problem'.

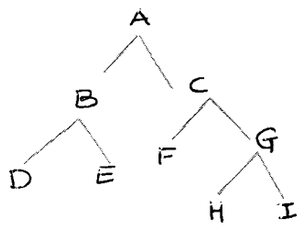
b) Are graphs in the figure below is isomorphic? Why?



Q.3 Answer the following : **(6 marks x 2 = 12 marks)**

a) Define and discuss 'Seating Arrangement Problem'.

b) For the Binary tree given find pre-order, in-order and post-order traversals.



Q.4 Write short notes on **ANY THREE** of the following : **(4 marks x 3 = 12 marks)**

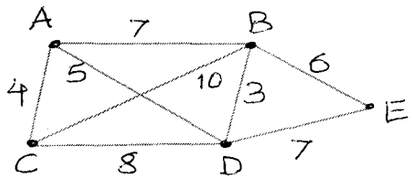
a) Floyde's Algorithm
b) Trees as models
c) MinMax Theorem
d) Representation of Graph

PTO

SECTION – II

Q.5 Answer the following : **(6 marks x 2 = 12 marks)**

a) Find the minimal spanning tree using Kruskal's algorithm for the graph shown below.

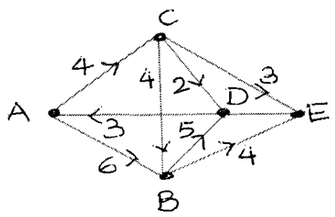


b) Illustrate: Breadth-First-Search(BFS) Algorithm.

Q.6 Answer the following : **(6 marks x 2 = 12 marks)**

a) Draw two 3 – regular graph with nine vertices.

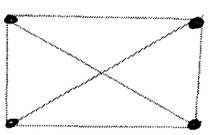
b) In the graph given below, capacity is given along each edge. Find the value of maximum flow from A to B in the network.



Q.7 Answer the following : **(6 marks x 2 = 12 marks)**

a) Explain the 'Travelling salesman problem' with the help of suitable example.

b) Find the minimum number of colors needed to paint the graph below.



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