

Total No. of Questions : 8]

SEAT No. :

PD-4081

[Total No. of Pages : 3

[6402]-41

**S.E. (Computer Engineering)/(Artificial Intelligence & Data Science)/
(Computer Science Engineering)
DATA STRUCTURES AND ALGORITHMS
(2019 Pattern) (Semester - IV) (210252)**

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer to the questions Q1 or Q2, Q3 or Q4, Q5 or Q6 and Q7 or Q8.
- 2) Assume the suitable data, if necessary.
- 3) Figures to the right indicate full marks.
- 4) Draw neat labelled diagram wherever necessary.

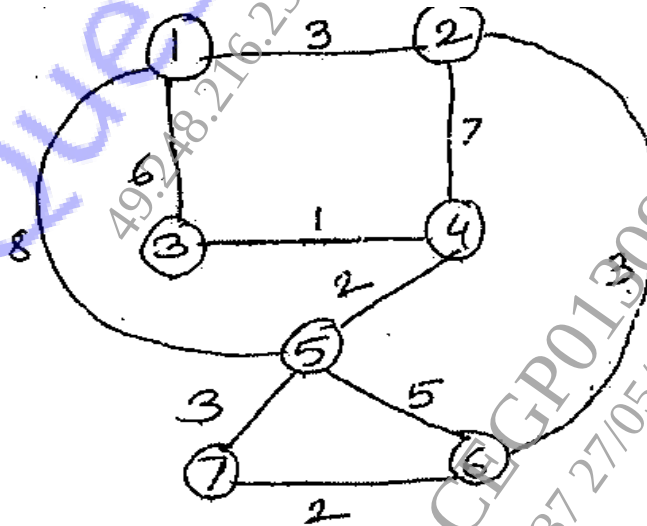
Q1) a) Define the following terms :

[6]

- i) Complete Graph
- ii) Connected Graph
- iii) Subgraph

b) Write a pseudo C/C++ code for depth traversal of graph represented using adjacency matrix. [6]

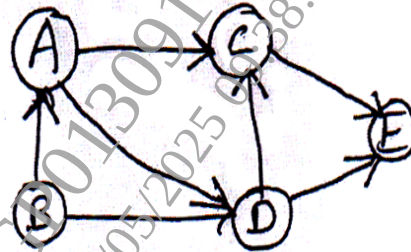
c) Find MST for the following graph using Prim's algorithm. Show various steps. [6]



OR

P.T.O.

- Q2) a)** Write an algorithm for BFS traversal of graph. [6]
- b)** Give difference between Prim's and Kruskal's algorithm. [6]
- c)** What is topological sorting? Find topological sorting of given graph. [6]



- Q3) a)** Build AVL tree for following input: A,Z,B,Y,C,X,D,U,E. Show balance factor of all nodes and name rotation in each step. [6]
- b)** Explain static and dynamic tree tables with suitable example. [6]
- c)** Explain with example Red Black tree. [5]

- Q4) a)** Write functions for LL and LR rotation with respect to AVL tree. [6]
- b)** Explain with example K dimensional tree. [6]
- c)** Construct AVL tree for following data: 15,20,24,10,13,7,30,36,25 [5]

- Q5) a)** Write an algorithm to delete data from B Tree. Create B tree of order 3 of following data 78, 21, 14, 11,97, 85, 74, 63, 45, 42, 57, 20, 16, 19. [10]
- b)** Explain Tric data structure to insert, delete, search operations with example. [8]

OR

- Q6) a)** Create B+tree of orders 5 of following data 5,30,50, 110, 80, 40, 10, 120, 60, 20, 70, 100, 35, 90. Perform deletion of values 90 and then 100 [10]
- b)** Explain following primary index, Secondary index, Sparse index and Dense index with example. [8]

- Q7) a)** Compare Sequential and Direct access file organization. **[8]**
- b)** What is the concept of Multilist Structure in file organization. Explain Coral ring for multilist structure **[9]**

OR

- Q8) a)** What is linked organization? Explain inverted file and cellular partitions with respect to linked organization. **[9]**
- b)** What is Sequential and index sequential file organization? State its advantages and disadvantages. **[8]**

