Total No. of Questions : 8]

SEAT No. :

P-1532

[Total No. of Pages : 3

[6002]-161

S.E. (Computer/AI & DS)

DATA STRUCTURES AND ALGORITHMS

(2019 Pattern) (Semester - IV) (210252)

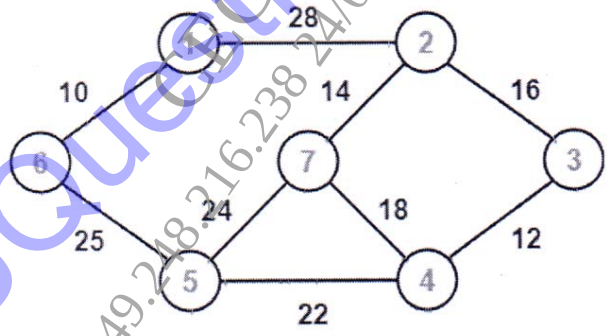
Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

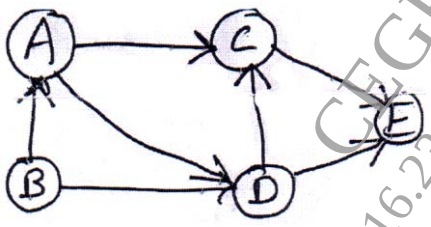
1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Assume suitable data, if necessary.***
3) ***Draw neat labelled diagram wherever necessary.***
4) ***Figures to the right indicate full marks.***

Q1) a) Write an algorithm for depth first traversal of a graph. **[6]**

b) Construct the minimum spanning tree (MST) for the given graph using Prim's Algorithm staring from vertex 6. **[6]**



c) What is topological sorting? Find topological sorting of given graph. **[6]**

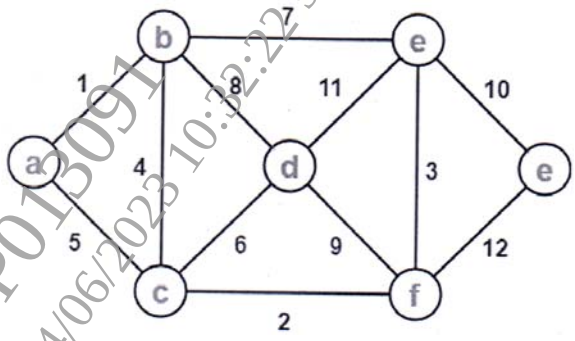


OR

P.T.O.

Q2) a) Write an algorithm for breadth first traversal of a graph. **[6]**

b) Using Prim's Algorithm, find the cost of minimum spanning tree (MST) of the given graph starting from vertex 'a' - **[6]**



c) Define the following terms : **[6]**

i) Complete Graph

ii) Connected Graph

iii) Subgraph

Q3) a) Construct an AVL Tree by inserting numbers from 1 to 8. **[6]**

b) Define Red Black tree. List its properties. Give example of it. **[6]**

c) Write functions for RR and RL rotation with respect to AVL tree. **[6]**

OR

Q4) a) Construct an AVL Tree for following data : **[6]**

50, 25, 10, 5, 7, 3, 30, 20, 8, 15

b) Explain with example K dimensional tree. **[6]**

c) Explain static and dynamic tree tables with suitable example. **[6]**

Q5) a) Construct a B-Tree of order 3 by inserting numbers from 1 to 10. **[9]**

b) Explain following primary index, Secondary index, Sparse index and Dense index with example. **[8]**

OR

Q6) a) Construct a B Tree of order 5 with the following data : **[9]**

D H Z K B P Q E A S W T C L N Y M

b) What is trie tree? Explain insert and search operation on it. **[8]**

Q7) a) Explain multilist files & coral rings. **[9]**

b) What is Sequential and index sequential file organization? State its advantages and disadvantages. **[8]**

OR

Q8) a) Explain inverted file & cellular partitions. **[9]**

b) Explain direct access file organization. State its advantages and disadvantages. **[8]**

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