

Total No. of Questions : 8]

SEAT No. :

PD-4097

[Total No. of Pages : 3

[6402]-57

S.E. (I.T.)

**DATA STRUCTURE AND ALGORITHM (DSA)**  
**(2019 Pattern) (Semester-III) (214443)**

*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) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

**Q1) a)** Convert following Infix Expression to Postfix and evaluate using stack  
(A/(B-C+D))\*(E-F)

A = 100 B = 20 C = 1 D = 6 E = 6 F = 2 [6]

- b) Explain stack PUSH and POP operations with example. [6]
- c) Explain Priority Queue with example. [6]

OR

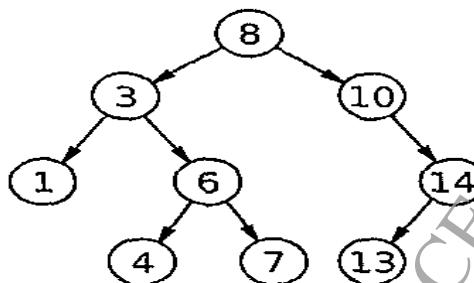
**Q2) a)** Convert following Infix Expression to Prefix and evaluate using stack

((A + B) — C \* (D / E)) [6]

A=10 B=10 C=6 D=15 E=5 [6]

- b) Explain stack using Linked List with example. [6]
- c) Explain Implicit stack and explicit stack with example. [6]

**Q3) a)** [6]



In a given BST state the output of Inorder, preorder, postorder, level wise traversals. Also draw mirror image.

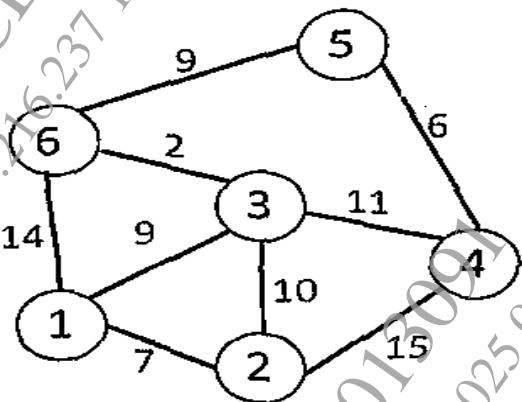
P.T.O.

- b) Explain recursive algorithm to display height of Binary Tree. [6]  
 c) Construct BST from below data  
 Inorder-7, 9, 4, 2 ,5,1, 3, 6, 8  
 Preorder-1, 2, 4, 7, 9, 5, 3, 6, 8 [5]

OR

- Q4)** a) Construct the expression tree from the following postfix expression using stack. AD \* BC + - [6]  
 b) State and Explain the algorithm to search data in BST. Give example. [6]  
 c) Explain advantages and disadvantages of TBT. [5]

**Q5)** a)

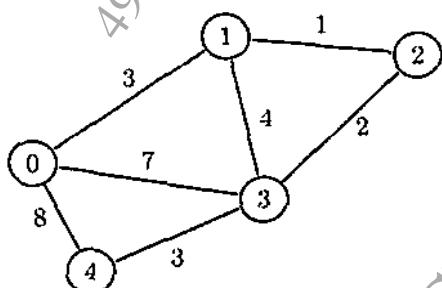


If '1' is the resource, explain step by step minimum spanning tree by 'Prims' algorithm. [6]

- b) Explain with example by which methods Graph is represented? [6]  
 c) Explain the heap sort technique with the help of example. [6]

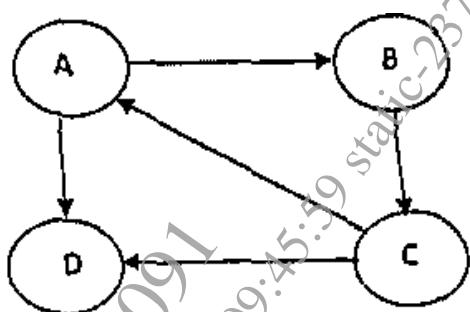
OR

**Q6)** a)



If '1' is the source, find the shortest path from source to all vertices, using Dijkstra's algorithm. Show answer step by step. [6]

b)



Show the output of DFT using stack. Use 'A' as a starting node. [6]

c) Explain with example OBST. [6]

*Q7)* a) Create the hash table using Linear Probing

Table size : 12

Data : 3, 2, 46, 6, 11, 13, 53, 12, 70, 90

Hash function:  $\text{data \% table size}$  [6]

b) Explain in brief any 3 Collision resolution techniques. [6]

c) Compare sequential file and direct access file with example. [5]

OR

*Q8)* a) Explain chaining without replacement with example. [6]

b) Explain with example different types of Hash functions. [6]

c) Differentiate 'ifstream' and 'ofstream' with example. [5]

