

Total No. of Questions : 8]

PC2837

SEAT No. :

[6352]-61

[Total No. of Pages : 3

S.E. (Information Technology)

DATA STRUCTURES AND ALGORITHMS

(2019 Pattern) (Semester-III) (214443)

Time : 2 ½ Hours

[Max. Marks : 70

Instructions to the candidates:

- 1) Attempt 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.*

Q1) a) Convert following Infix Expression to Postfix and evaluate using stack
 $(A/B-C+D^*E)$ [6]

$$A=30 \ B=2 \ C=5 \ D=10 \ E=6$$

- b) Explain queue ENQUEUE and DEQUEUE operations with example. [6]
- c) Explain Any One application of Queue with figure. [6]

OR

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

$$M * N + (P - Q) + R$$

[6]

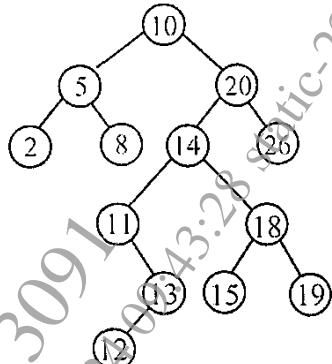
$$M=2 \ N=5 \ P=3 \ Q=6 \ R=1$$

- b) Draw and explain circular and circular double queue with advantages and disadvantages. [6]
- c) Explain ‘Dqueue’ data structure with figure. [6]

P.T.O.

Q3) a)

[6]



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

- b) Explain recursive algorithm to display height of Binary Tree. [6]
- c) Construct BST from below data [5]

Inorder - 17,32,44,48,50,62,78,88

Postorder - 32,17,48,62,50,88,78,44

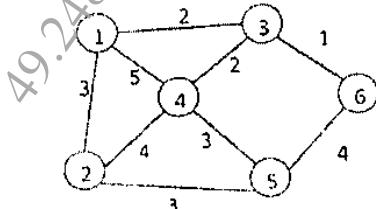
OR

Q4) a) Construct the expression tree from the following prefix expression using stack. [6]

/, *, -, 4, 7, 9, 3

- b) State and explain algorithm to display binary tree level wise. Give example. [6]
- c) Draw and explain how TBT is efficient than BT. [5]

Q5) a)



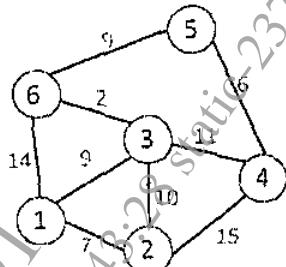
If '1' is the resource, explain step by step minimum spanning tree by 'Prims' algorithm.

- 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)

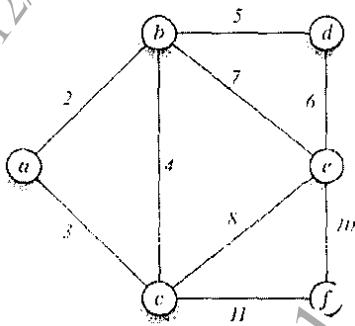
[6]



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

b)

[6]



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

c) Explain with example OBST. [6]

Q7) a) Create the hash table using Linear Probing [6]

Table size : 15

Data : 30, 61, 46, 77, 33, 93, 105, 70, 1

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

b) Explain with example characteristics of good hash function. [6]

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

OR

Q8) a) Explain chaining with replacement with proper example. [6]

b) Compare sequential, Index sequential and direct access files. [6]

c) State and Explain an algorithm to merge 2 sequential files into 3rd sequential file. [5]

