

B.Tech II Year I Semester (R13) Supplementary Examinations June 2017

DATA STRUCTURES

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- What is data structure? In what areas do the data structures applied?
 - What is LIFO?
 - What are the methods available in storing sequential files?
 - Define Binary Search Tree. Give example.
 - Draw the node structure of adjacency multilist. Given example.
 - What are the types of Collision Resolution Techniques and the methods used in each type?
 - Write the steps in decreasing the key in Fibonacci heap.
 - Define shortest(x) for the leftist trees.
 - Define AVL Tree.
 - Create a B – tree of order 2 – 3 for the data {40, 10, 20, 70, 80}.

PART – B
(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 Write the procedure to convert an infix expression into postfix form. Convert the following infix expression into post fix by using the above procedure.
- $$x + y * z + (p * q + r) * s.$$

OR

- 3 (a) Write an algorithm to delete an element from circular queue.
(b) What is a queue? Explain the array representation of it with suitable example.

UNIT – II

- 4 (a) Construct the binary tree for the following sequence of nodes in preorder and inorder respectively.
Preorder : G, B, Q, A, C, K, F, P, D, E, R, H
Inorder : Q, B, K, C, F, A, G, P, E, D, H, R
(b) Give brief description about the sorting of elements by using merge sort.

OR

- 5 List the operations that can be performed on trees. Explain the tree traversal techniques with suitable example.

UNIT – III

- 6 Draw a picture of the directed graph specified below: $G = (V, E)$ $V(G) = \{1, 2, 3, 4, 5, 6\}$ and $E(G) = \{(1,2), (2, 3), (3, 4), (5,1), (5, 6), (2, 6), (1, 6), (4, 6), (2, 4)\}$. Obtain the following for the above graph:
(i) Adjacency matrix. (ii) Reach ability matrix.

OR

- 7 Define hashing. Give brief description about the following with suitable example:
(a) Division method.
(b) Mid square method.
(c) Folding method.
(d) Digit analysis.

UNIT – IV

- 8 Sort the following list by using Max Heap Sort technique and Write the intermediate steps:
20, 12, 25 6, 10, 15, 13.

OR

- 9 (a) Write short notes on skip lists.
(b) How can we insert an element into a binomial heap? Explain with example.

UNIT – V

- 10 With the help of suitable example, explain the AVL Tree double rotations.

OR

- 11 Give brief description about the following trees:

- Splay Trees.
- Red Black Trees.