Reg. No. :

Question Paper Code: 31322

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Computer Science and Engineering

01UCS302 - DATA STRUCTURES

(Regulation 2013)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define stack. List few applications of stack.

2. Convert the infix *(a+b)*(c+d)/f* into postfix and prefix expression.

3. Define full binary tree. Give an example.

4. How to convert binary tree into threaded binary tree? Give example.

5. What is AVL tree? List the properties of the AVL Tree.

6. What is Heap?

7. Define collision resolution.

8. Define equivalence relation problem?

9. What is topological sort?

10. Define In-degree of graph.

PART - B (5 x 16 = 80 Marks)

11. (a) Write a function to perform the following operations in doubly linked list. (i) Creation (ii) Insertion (iii) Deletion (iv) Traversal in both ways.   (16)

Or

(b) Develop an algorithm to implement a stack ADT. Give relevant example and diagrammatic illustrations. (16)

12. (a) (i) Write a function to insert an element in the binary search tree. (10)

(ii) Explain about the expression trees. (6)

Or

(b) (i) Construct binary search tree to insert the following key elements:
23, 44, 18, 20, 12, 52, 19, 38 and delete 44 from it. (8)

(ii) Explain the operation of threaded binary tree. (8)

13. (a) Explain the following routines in AVL tree with example: (i) Insertion (ii) Deletion (iii) Single rotation (iv) Double Rotation. (16)

Or

(b) (i) Describe the operation of B-tree for 2-3 tree with example. (8)

(ii) Explain the operation which is performed on splay trees. (8)

14. (a) (i) Explain the algorithm which is associated with path compression. (8)

(ii) Explain the collision resolution techniques in hashing. (8)

Or

(b) Create extendible hash structure to insert the following key elements: 2, 3, 5, 7, 11, 17, 19, 23, 29, 31. Show the extendable hash structure for this file if the hash function is *h(x)=x mod 8* and buckets can hold three records. (16)

15. (a) (i) Explain the Dijkstra's algorithm to shortest path with suitable example. (10)

(ii) Explain the topological sorting with example. (6)

Or

(b) Explain about Prim's and Kruskal's algorithm in detail with example. (16)

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