Reg. No. : | | | | | | | | | | |

Question Paper Code: 31022

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

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. Write any two applications of queue.
2. What data structure is used in the execution of a recursive function?
3. Define the degree of a tree.
4. What is meant by a thread in a threaded binary tree?
5. What is the need for balancing a tree?
6. What is a heap? Give an example.
7. Write down the time complexity of Hash search.
8. What is linear probing in hash table? Why it is done?
9. What is the significance of minimum spanning tree?
10. What is an articulation point in a graph?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain how a stack can be used to evaluate a postfix expression with an implementation in *C* language using an example. (8)

(ii) Write an algorithm to merge two sorted linked lists into a single sorted list. (8)

Or

(b) Explain the circular queue implementation using

(i) Array (8)

(ii) Linked list (8)

12. (a) Perform the three types of tree traversals of the binary tree constructed using the expression *((A+B)/C-D*E^F)* and write down the implementation in C using recursion. (16)

Or

(b) Explain the process of insertion and deletion in a binary search tree. (16)

13. (a) Construct an AVL tree by inserting the keys 7, 2, 3, 8, 16, 25 into an initially empty binary tree and explain the rotations of AVL tree. (16)

Or

(b) Explain with examples how a key value can be inserted and deleted in a B-Tree. (16)

14. (a) What is collision in Hash Table? Explain the collision resolution strategies with suitable example. (16)

Or

(b) (i) Explain the two permissible operations in dynamic equivalence problem. (8)

(ii) Explain in detail about the path compression algorithm. (8)

15. (a) Write down the Digikstra's algorithm to find the shortest path and explain it with an example. (16)

Or

(b) Construct a minimum spanning tree using Prim's algorithm and Kruskal's algorithm for the following graph. (16)