14CS/IT305

Hall Ticket Number:

II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION

November, 2019 — **Common to CSE & IT**

Third Semester — **Data Structures**

Time: Three Hours — **Maximum:** 60 Marks

Answer Question No.1 compulsorily. (1X12 = 12 Marks)

Answer ONE question from each unit. (4X12=48 Marks)

1. Answer all questions (1X12=12 Marks)
   a) Define Time and Space complexity.
   b) What are the applications linked list?
   c) Differentiate Linear and Non-linear data structures.
   d) What do you mean by Stack overflow and stack underflow?
   e) Evaluate 235*6+7*-
   f) Give the purpose of Circular Queue.
   g) What is delimiter matching?
   h) What are the different ways to select pivot element in Quick Sort?
   i) Differentiate left skewed tree and right skewed tree.
   j) Drawbacks of binary search trees.
   k) Define separate chaining.
   l) What are the various ways to represent graph?

UNIT I

2. a) Describe various classifications of data structures with suitable examples. 7M
   b) Write a C function to reverse the elements of a singly linked list. 5M

(OR)

3. a) Explain the concept of insertion operation in single linked list. 7M
   b) Write an algorithm to perform polynomial multiplication using linked list. 5M

UNIT II

4. a) Convert the following infix expression in to postfix 7M
   (a+b*c)+(d+e/f)
   b) Differentiate linear queue and circular queue with suitable example. 5M

(OR)

5. a) Explain Quick Sort and demonstrate by using the following list
   12, 25, 45,56,66, 75,100,139,177,222,245,267 7M
   b) Write short notes on Queue applications. 5M

UNIT III

6. a) Explain the concept of single and double rotations of AVL tree. 9M
   b) Differentiate complete binary tree and full binary tree with an example. 3M

(OR)

7. a) Write a c routine for tree traversals. 6M
   b) Construct binary search tree for the following 10, 40 ,30, 25 ,56 ,47, 92 12 6M

UNIT IV

8. a) Explain various representations of a graph. 6M
   b) Explain the concept of open addressing. 6M

(OR)

9. **Exp**lain in detail about BFS and DFS in graph with suitable example. 12M

(14CS/IT305)

Bapatla Engineering College

III/IV B.Tech DEGREE EXAMINTION

ELECTRONIC S & INSTRUMENTATION ENGINEERING

DATA STRUCTURES

(CSE and IT Branches)

Time : 3 Hours **Total Marks: 60**

Answer Question No. 1 compulsorily **(12x1=12 Marks)**

Answer ONE Question from each Unit **(4x12=48 Marks)**

1. Answer all the Question **12 x 1 =12M**

a. Define algorithm and list its criteria.
b. Differentiate linear and non-linear data structures.
c. What is the difference between array and linked list?
d. Define space complexity.
e. How a node of a linked list can be represented?
f. Convert the infix expression (A+B)*C into prefix.
g. Define queue and represent with a schematic diagram.
h. Write the need of 'partitioning element' in Quick Sort?
i. Distinguish between binary tree and binary search tree.
j. Define AVL tree and represent a tree with balance factor.
k. 'Graph is a non-linear data structure'. Justify.
l. What data structure is used while traversing a graph using BFS?

UNIT-1

1. a) Write a C program that demonstrate the creation, insertion(At begin and at end) and traversing of singly linked list. **7M**
   b) Write a C function to reverse the elements of a linked list. **5M**

(OR)

2. a) Write a C program to implement the creation and deletion operations in a double linked list. **7M**
   b) Write an algorithm to perform polynomial multiplication using linked list. **5M**

3. a)Write a C program to implement operations of stack using arrays. **7M**
   b)Write a C function to implement delimiter matching. **5M**

(OR)

4. a)Explain Merge Sort and demonstrate by using the following list
   12, 25, 45,56,66, 75,100,139,177,222,245,267 **7M**
   b)Write short notes on Circular Queues. **5M**

5. a) Discuss about the properties and various representations of a binary tree. **9M**
b) What is the importance of representing AVL trees? **3M**

(OR)

6. a) Discuss various cases of deleting a node from a binary search tree by illustrating with an example. **6M**
b) Write recursive function for preorder traversal of a binary tree and demonstrate with an example **6M**

7.a) Explain the implementation of Priority Queues. **6M**
b) Explain the algorithm for Separate Chaining. **6M**

(OR)

8. a) Explain various representations of a graph. **9M**
b) Distinguish between graph and tree. **3M**