Student Exam No: _____

GANPAT UNIVERSITY

B. TECH. SEMESTER - IV (Computer Engineering/Information Technology)

REGULAR EXAMINATION MAY – 2014

2CE403/2IT403: DATA SRTUCTURE

Time: 3 Hours] [Total Marks: 70

Instructions:

- Figures to the right indicate full marks.
- Attempt each section in separate answer book.
- Be precise and to the point in your answer.

SECTION-I

Q-1 [A] Differentiate the following terms: [4]
a) Linear and non-linear Data Structures
b) Primitive and Non-Primitive Data Structures

[B] Differentiate: stack & queue. Also explain priority queue. [4]

[C] Give tracing of following list of numbers using Selection sort. [4]
23,32,43,11, 65,99,57,84,36

OR

Q-1 [A] A circular queue has an array of size N. Write C function to add an item to rear of the queue and a C function to delete an item from front of the queue. [4]

[B] Suppose circular queue is maintained by an array Q with 12 memory location and front and rear are the two pointers. Find the number of element in Q with diagram when: [4]

Front=4,Rear=8
Front=10,Rear=3
Front=5,Rear=6
Front=7,Rear=3

[C] Write a program for an output-restricted de queues. [4]

Q-2 [A] What are the different types of searching techniques? Explain the one which is more efficient with algorithm. [4]

[B] Create the heap tree for the following sequence of numbers: [4]
25,57,48,37,12,92,86,33

[C] Describe an algorithm to INSERT a node at the end of Singly Linked List. [3]

OR

Q-2 [A] Discuss an algorithm to DELETE a node at the beginning in Doubly Linked List. [4]

[B] Write an algorithm to insert a node at the end in Circular Linked List. [4]

[C] Describe an algorithm to INSERT a node at particular position in Singly Linked List. [3]

Q-3 [A] Write an algorithm for Quick sort. [6]

[B] Explain the algorithm for Bubble sort and Give tracing of following list of data: [6]
12,2,16,30,8,28,4,10,20,6

[P.T.O]

SECTION-II

Q-4 [A] What is m-ary tree? State the procedure to obtain binary tree from general m -ary tree with example. [8]

[B] Discuss different ways to represent the tree data structure. [4]

OR

Q-4 [A] Demonstrate with example how stack data structures is used to obtain the DFS traversal of graph. [8]

[B] What is simple binary tree? Discuss with example to convert given binary tree into full binary tree. [4]

Q-5 [A] Convert following infix expression into postfix expression using stack. [6]

1 * 1 + ((2+2) – 3/3) * 4 (priority levels: (*,/ = 8) ,(+ , - = 4))

[B] Discuss array way of implementing PUSH and POP stack operations. [5]

OR

Q-5 [A] Demonstrate complete recursive procedure (call and return function call) to find sum of digits in given number 1234. [6]

[B] Write a C program module using pointer to convert every odd positioned character into lowercase letter. [5]

Q-6 [A] Construct Binary search tree: [5]

50, 45, 10,68,90,32,54,65,78,30,12,2 (Root node is : 50)

[B] Construct binary tree & find pre order traversal sequence using given in order and post order sequence. [5]

In order: DEBAGFHIC

Post order: EDBGIHFCA

[C] Define followings: [2]

1. Null graph.
2. Multi graph.

----- End of Paper-----