PARUL UNIVERSITY
PARUL INSTITUTE OF COMPUTER APPLICATION
BCA DEPARTMENT
Mid Term Examination – March, 2017

Subject Code: 05101152/05301152
Subject Title: Data Structures
Course: BCA / IMCA Semester: 2

Date: 11-4-17
Time: 10 to 11:30 am
Total Marks: 50

Q-1 Solve the following MCQs. (Any 6) **[06]**

1 Finding the location of the element with a given value is:
- a. Merging
- b. Traversal
- c. Searching
- d. Sorting

2 Base address of array contains address of _____
- a. Array element
- b. 1st array element
- c. last array element
- d. all Array elements

3 Arrays are best data structures
- a. for relatively permanent collections of data
- b. for the size of the structure and the data in the structure are constantly changing
- c. for both of above situation
- d. for none of above situation

4 When a new node is inserted in between a linked list,which of these is true?
- a. Only the nodes that appear after the new node need to be moved
- b. Only the nodes that appear before the new node need to be moved
- c. The nodes that appear before and after the new node need to be moved
- d. none

5 The prefix expression for the infix expression a * (b + c) /e - f is
- a. /* a + bc – ef
- b. -/ * + abc ef
- c. / * a + bcef
- d. none of the above

6 Which of following are dynamic memory allocation functions in C language?
- a. New
- b. Delete
- c. Malloc
- d. Realloc

7 An algorithm that calls itself directly or indirectly is known as
- a. Sub algorithm
- b. Recursion
- c. Polish notation
- d. Traversal algorithm

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9 Availability Stack contains ____
- a. Free nodes
- b. Allocated nodes
- c. Both of the above
- d. None of the above

10 One difference between a queue and a stack is:
- a. Queues require dynamic memory, but stacks do not.
- b. Stacks require dynamic memory, but queues do not.
- c. Queues use two ends of the structure; stacks use only one.
- d. Stacks use two ends of the structure, queues use only one.

Q-2 Answer the following questions. (Any 8) **[08]**

1 Define Non-Primitive Data Structure.
2 List any 5 applications of DS.
3 Give example of postfix expression.
4 Define B tree.
5 What is the use of PEEP operation?
6 Why height balanced tree is used?
7 What is Stack Overflow fetal error?
8 Differentiate: Simple Queue Vs Circular Queue.
9 Write generalized formula for calculating address of N dimensional array element.
10 Draw string storage structure using special field.

Q-3 Answer the following questions. (Any 4) **[8]**

1 Write an algorithm for insertion of new element into the Stack.
2 Give types of linked list.
3 Draw a binary Tree for the expression :
A * B - (C + D) * (P / Q)
4 What are the differences between Recursive and Non-Recursive Function
5 What is the difference be B tree & B+ tree?
6 Assume that 4 bytes of storage is required to hold each element of three dimensional Array A and storage for array begins with location 2000 in memory. If subscripts limits are 1<=i<=3, 1<=j<=3, -1<=k<=0 then calculate address of A(2,3,0).

Q-4 Answer the following questions. (Any 2) **[8]**

1 Explain Stack and its operations with examples. (write algorithm also)
2 Create B tree from given order of keys:
78 9 2 35 65 4 14 19 20 85 26 94 46 90 69 6 16
3 Write an algorithm for insertion of new element at the last position of the Linked List.
4 Write algorithm for Postfix Expression evaluation.

**** All the Best****