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Total Number of Pages: 01

M.Sc.I
FBEF210

2nd Semester Regular Examination – 2016-17

DATA STRUCTURE USING C

BRANCH(S): M.Sc.I(AC)

Time: 3 Hours

Max marks: 70

Q.CODE:Z1218

Answer Question No.1 which is compulsory and any five from the rest.

The figures in the right hand margin indicate marks.

- Q1 Answer the following questions:** (2x10)
- What is an algorithm? Which criteria should an algorithm satisfy?
 - Explain the term ADT with suitable example.
 - Store the following polynomial using linked list –
 $4x^3 + 3x^2 - 15x + 45$
 - If R is a matrix of characters with dimensions 5 × 6, stored in row major order with base address 2000, then find out the address of the element at A[2][3].
 - Construct the binary tree to represent the following expression: $a + b * c / d / e - f$
 - What is priority queue?
 - What is Recursion? Which data structure is used to implement recursion?
 - What is Stack and where it can be used?
 - What is a Queue, how it is different from stack and how is it implemented?
 - Define a stack.
- Q2**
- Convert the following infix expression to it postfix expression using stack and demonstrate the steps involved and the stack stages. $(A + B) * C - D + (E * F / G)$ (5)
 - Write an algorithm to search an element in a Binary Search Tree. (5)
- Q3**
- Write an algorithm to insert a node at the beginning of single circular linked list. (5)
 - Write an algorithm to delete a node present at any given position from a double linked list. (5)
- Q4**
- What is a 'Sparse' matrix? Write a C program to represent a sparse matrix in 3-tuple form. (5)
 - Write the C functions or algorithms to perform insertion and deletion in a circular queue. (5)
- Q5**
- Differentiate between Depth First Search (DFS) and Breadth First Search (BFS) (5)
 - Explain the term Garbage collection and compaction with examples. (5)
- Q6**
- Explain the algorithmic techniques Divide and Conquer and Greedy method using an algorithm (5)
 - Explain the creation of a binary search tree. (5)
- Q7**
- Write an algorithm to sort the elements of an array using Quick sort technique. (5)
 - Sort the following elements using Radix sort technique. Demonstrate each step involved. (5)
 103, 95, 68, 110, 47, 59, 9, 74, 134, 283, 31, 28
- Q8 Write short notes on the following (Any Two):** (5 x 2)
- Post fix notations
 - Binary Tree
 - Algorithm
 - AVL tree