Total No. of Printed Pages:2

SUBJECT CODE NO:- P-75
FACULTY OF ENGINEERING AND TECHNOLOGY
S.E.(CSE/IT) Examination May/June 2017
Data Structures using C
(Revised)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
ii) Solve any two questions from each section from the remaining questions.

Section A

Q.1 Solve any five 10
a) Explain address (&) operator and dereferencing (*) operator.
b) Define time and space complexity
c) Explain two-dimensional array
d) Explain realloc () and calloc () functions with example.
e) Write push function to add an item to a stack.
f) What are disadvantages of queue? How to overcome it?
g) What is multiple queue?
h) Assume stack of size 2 and show diagrammatic representation for following operations: PUSH(20) , PUSH(40), POP() , PUSH(50) , PUSH (60). Indicate top pointer.

Q.2 a) Define Algorithm. Explain all criteria that every algorithm should satisfy. 08
b) Write C program for transpose of sparse matrix. 07

Q.3 a) Create an ADT for natural number to perform operations: ISZero, Zero, Equal, successor, add, subtract, multiply, divide. 07
b) How to represent circular singly linked list. Explain insert and delete operations on circular singly linked list. 08

Q.4 a) Evaluate given postfix expression using stack. 07
6 2 / 3 - 4 2 * +
b) How to represent polynomial? Write a function to add two polynomials. 08

Q.5 a) Write C Program to implement queue using dynamic array. 07
b) What is linked list? Explain different types of linked list with example. 08

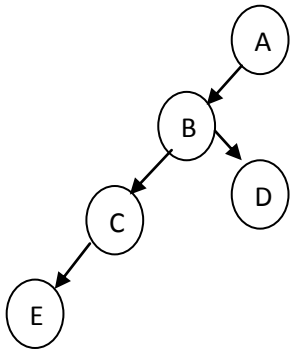
Section B

Q.6 Solve any five of the following 10
a) Give the array representation of a binary tree.
b) Define complete binary tree, Give example.
c) What is heap? Give max heap property?
d) What is path and cycle in graph?
e) Define single ended and double ended priority queue
f) What is weight biased leftist tree

g) What is balance factor in AVL tree
h) What is property of binary search tree?

Q.7 a) Define a forest. How to transform a forest into a binary tree. Explain all forest transversal techniques. 08
b) Explain Fibonacci heap with example? 07

Q.8 a) What is threaded binary tree? Show threaded binary tree representation of the given binary tree 07



b) Define height-balanced binary tree. Assume that insertions are made in the following order. Uranus, Earth, Venus, Mars, Mercury, Jupiter, Saturn, Neptune. 08

Q.9 a) Explain graph representation techniques : 07
1) Adjacency matrix
2) Adjacency List

b) Define pairing Heap & explain all operations on pairing heap. 08

Q.10 a) Start with an empty red-black tree & insert the following keys in the given order 15, 14, 13, 12, 11,10,9. 07
b) Explain In order preorder and postorder traversals for binary tree with algorithm and example. 08