Total No. of Questions : 8]

SEAT No. :

P3857

[Total No. of Pages : 3

[5057] - 2045

S.E. (E & TC / Electronics) (Semester - I)

DATA STRUCTURES AND ALGORITHMS

(2015 Pattern)

Time : 2 Hours] *[Max. Marks : 50*

Instructions to the candidates :-

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Use of non-programmable electronic pocket calculator is allowed.***
4) ***Assume suitable data if necessary.***

Q1) a) Write a C function with and without pointers to arrays for checking whether the given string is a Palindrome or not. **[6]**

b) Write a C function for the Binary search. Compare the time complexities of Linear, Binary and Fibonacci search. **[6]**

OR

Q2) a) Explain parameter passing by value & by reference with example of swapping of two values. **[6]**

b) Sort the following numbers 75, 15, 58,-5, -22, 34, 54, 28, 27, 1 using :**[6]**

i) Bubble Sort

ii) Merge sort

Q3) a) Identify the expressions and convert them into remaining two forms:

i) AB +C*DE–FG++$

ii) –A/B*C$DE

Note: $ = Exponent operator **[7]**

b) Define queue. What are conditions for queue empty and queue full when queue is implemented using Array? Explain. **[6]**

P.T.O.

OR

Q4) a) Write a function PUSH and POP in 'C' for stack using Linked List. **[7]**

b) A doubly linked list with numbers to be created. Write node structure and algorithm to create the list. **[6]**

Q5) a) Construct the Binary Search Tree (BST) from following elements : **[6]**

5,2,8,4,1,9,7

Also show preorder, inorder and postorder traversal for the same.

b) Explain with suitable example how Binary Tree can be represented using: **[6]**

i) Array

ii) Linked List

OR

Q6) a) Construct Binary Search Tree(BST) for the following: **[6]**

MAR, MAY, NOV, AUG,APR, JAN, DEC, JUL,FEB,JUN, OCT, SEPT

b) Write a Recursive 'C' function for Preorder and Postorder traversal of a Binary Search Tree. **[6]**

Q7) a) What do you mean by adjacency matrix and adjacency list? Give the Adjacency matrix and Adjacency list as shown in Figure (1) . **[7]**

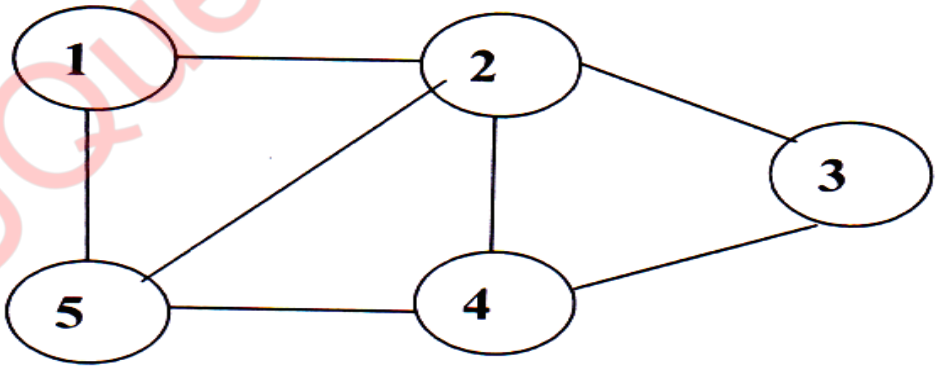

Figure (1)

b) Define DFS and BFS graph with example. **[6]**

OR

Q8) a) Find out the Minimum Spanning Tree of the following graph Figure(2) using : **[7]**

i) Prim's Algorithm

ii) Kruskal's Algorithm

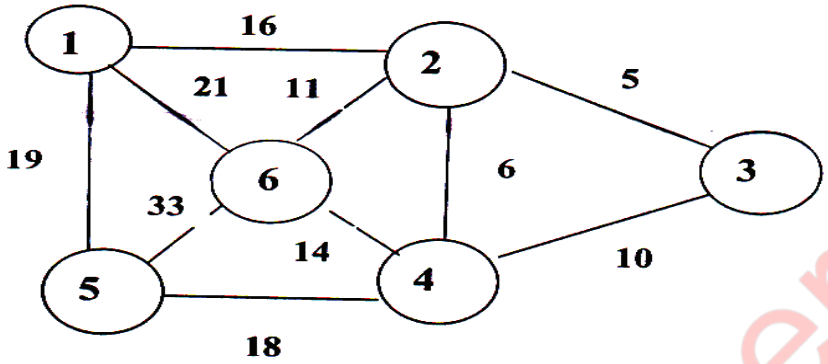

Figure (2)

b) Explain Dijkstar's Algorithm with example. **[6]**