

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]

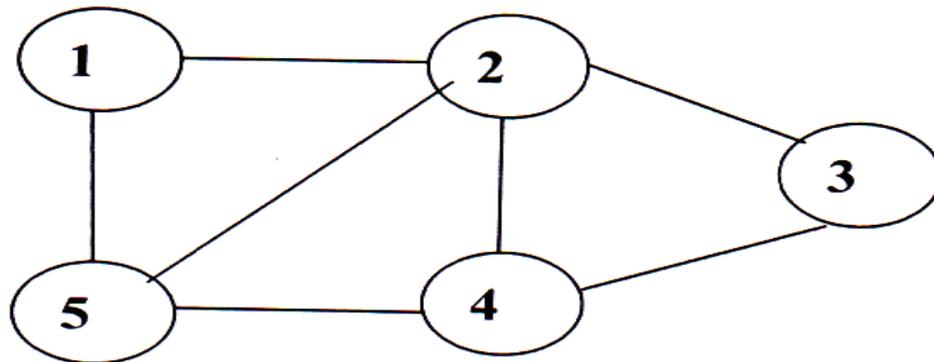


Figure (1)

- 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

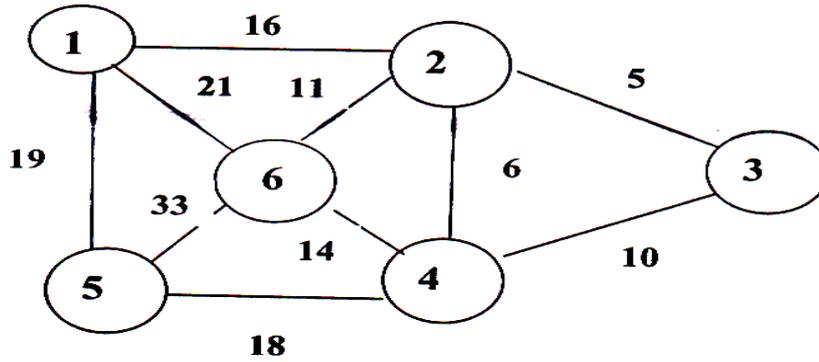


Figure (2)

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

