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CSIT124 Enrol. No. A7605214078

[ETD]

END SEMESTER EXAMINATION : NOV.–DEC., 2015

DATA STRUCTURES USING C

Time : 3 Hrs. *Maximum Marks : 70*

Note: ***Attempt questions from all sections as directed.***

SECTION – A (30 Marks)

Attempt any **five** *questions out of* **six.**

Each question carries **06** *marks.*

1. (a) Define Graph and list any three application area of graph. (3)

   (b) Design a recursive factorial function using C language. (3)

2. Assume the declaration of multidimensional arrays A and B to be, A (–2:2, 2:22) and B (1:8, –5:5, –10:5) (i) Find the length of each dimension and the number of elements in A and B. (ii) Find the address of the element B(9), assuming Base (B) = 400 and there are W = 4 words per memory location.

P.T.O.

3. (a) Write an algorithm to evaluate a postfix exp

(b) Execute your algorithm using the following postfix expression as your input :–

ab + cd + *f^. (3)

a = 3, b = 4, c = 2, d = 2, f = 1

4. What is the advantage of circular queue over ordinary queue ? Mention any 2 applications of queues. Design a function CQINSERT in for static implementation of circular queue.

5. Simulate the Insertion sort sorting algorithm and show the step-by-step procedure to sort the given data values : 23, 11, 37, 28, 15, 19, 55.9.

6. (a) Create a Heap when the values 100, 200, 10, 30, 60, 80, 90, 300 are entered. (3)

(b) Write a program in C to multiply two matrices A and B. (3)

SECTION – B (20 Marks)

Attempt any **two** *questions out of* **three.**
Each question carries **10** *marks.*

7. Answer the following with respect to the below gi

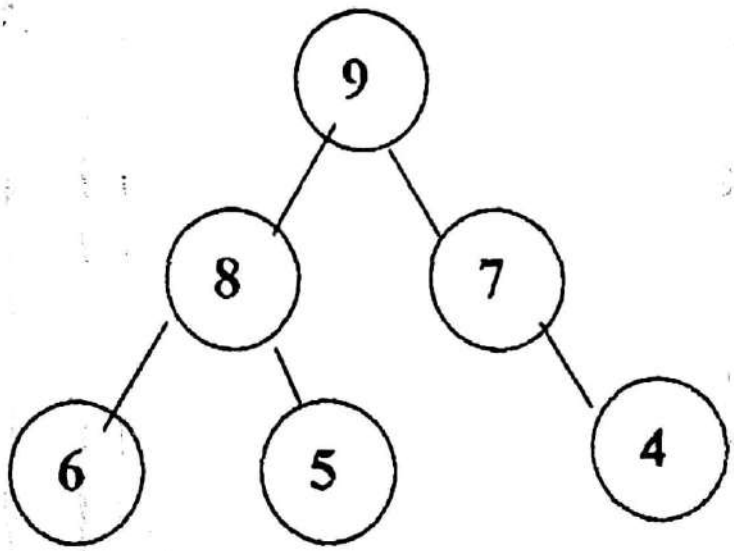
(i) Is it a Binary search tree ?

(ii) Is it a Complete tree ?

(iii) Give the list notation.

(iv) Where will be the left child of node 4 pointing to if it is converted to a threaded binary tree ?

(v) Is it a max-heap ? (2×5=10)



8. (a) Consider the following stack of characters, where STACK is allocated N = 8 memory cells

STACK : A,C,D,F,K,_,_,_. (_ means empty allocated cell). Describe the stack as the following operations takes place : (a) POP(STACK, ITEM)

(b) POP(STACK, ITEM) (c) POP(STACK, ITEM)
(d) PUSH(STACK, R) (e) PUSH(STACK, L)
(f) PUSH(STACK, S) (g) PUSH(STACK, P)
(h) POP(STACK, ITEM). (5)

(b) Write a program in C to design one functions: 'del_beg" to delete a node from the beginning of the linked list. (5)

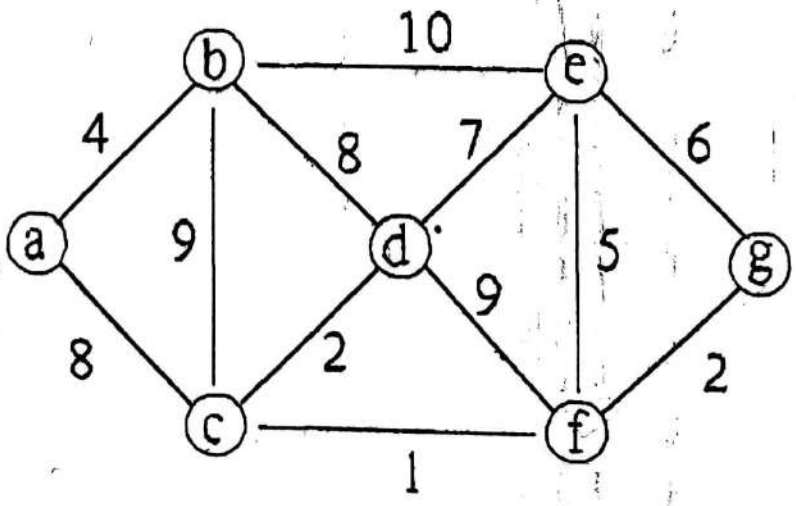
9. Suppose the following list of letters is inserted in order into an empty binary search tree : J, R, D, G, T, E, M, H, P, A, F, Q (i) Construct the binary search tree, (ii) Find the in-order, pre-order and post-order traversal of BST created. (10)

SECTION – C (20 Marks)

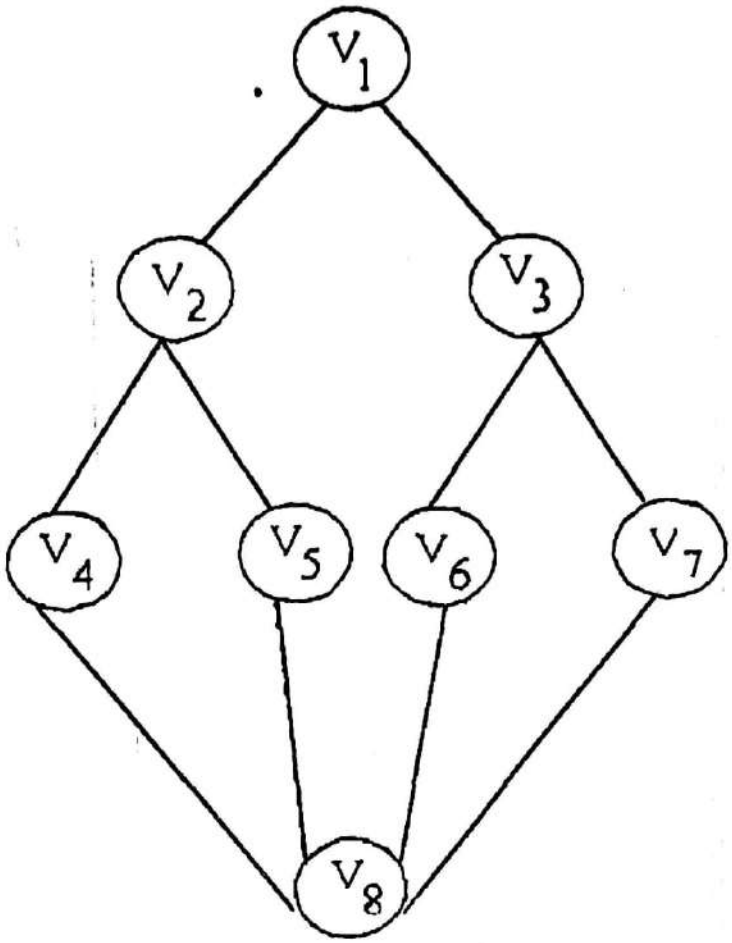
(Compulsory)

10. (a) (i) What are the parameters on the basis of which an algorithm can be analyzed ? (3)

(ii) Find the Minimum Cost Spanning tree in given graph using Kruskal's algorithm. (7)



(b) For the given graph give the adjacency list.



- Write the BFS algorithm and traverse it starting from the vertex V_7 showing various stages.

(10)

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