Odd Semester, 2020

(Held in March, 2021)

COMPUTER SCIENCE

(Elective/Honours)

(CS–101 T)

(Data Structure Using C)

Marks : 37

Time : 2 hours

The figures in the margin indicate full marks for the questions

Answer *any* **one** question from each Unit

UNIT—I

1. *(a)* What is a flowchart? Draw a flowchart to find out the greatest of three numbers. 1+3=4

   (b) What are keywords in C? Give example. What restrictions apply to their uses? 1½+2=3½

   (c) What is a datatype? 2

(2)

2. *(a)* Define array. How does an array definition differ from that of an ordinary variable? 1+2=3

   (b) What is the purpose of the following functions? 3

   getch(), getchar(), gets()

   (c) What is the purpose of typedef feature? Explain how typedef is used in conjunction with structures. 1½+2=3½
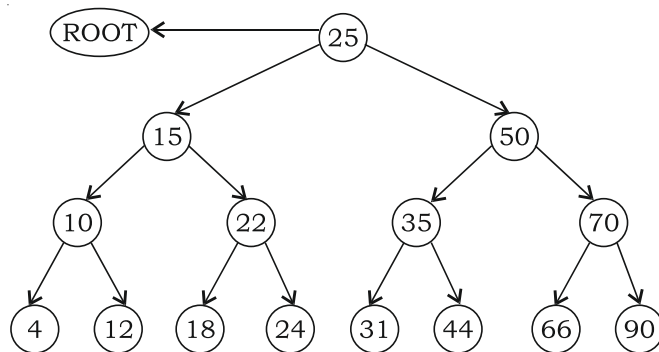
UNIT—II

3. *(a)* Define complexity of algorithm. 1

   (b) Distinguish between best, worst and average case complexities of an algorithm. 2

   (c) What are the different characteristics of a linked list? 3

4. *(a)* Distinguish between a stack and a queue. 3

   (b) Write notes on the following : 1½×2=3

     (i) Circular queue

     (ii) Dequeue

(3)

UNIT—III

5. *(a)* What is a binary tree? How does a binary tree differ from a general tree?

2+1=3

(b) Write a C function to find out the largest element in a binary search tree. 3½

(c) If the root node is the only node present in the tree, can it be called a leaf node? Justify. 2

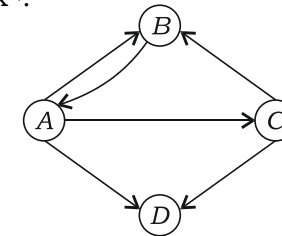**6.** *(a)* Write down the inorder, preorder and postorder Traversal for the below binary tree : 5

(b) Explain a threaded-binary tree. 3½

(4)

UNIT—IV

7. *(a)* The following is a directed graph where there are no weights assigned to the edges. Construct the adjacency matrix and adjacency list for this graph. Also find the indegree and outdegree of each vertex : 4½

(b) What is meant by incidence matrix of a graph? 2

8. *(a)* Briefly explain the traversal methods of a graph. 4½

(b) What is a minimal spanning tree? 2

UNIT—V

9. *(a)* Write a C program to implement binary search. 5

(b) Define hashing. 1½

10. *(a)* Explain in brief the different collision resolution techniques. 5

(b) Write down the complexity of bubble sort algorithm. 1½

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