

1/EH-73 (i) (Syllabus-2015)

2016

(October)

COMPUTER SCIENCE

(Elective/Honours)

(Data Structure using C)

(CS-101 T)

Full 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) Differentiate between while and do-while loops. 2
- (b) What is a symbolic constant? 2
- (c) What are library functions? Explain the uses of gets() and puts(). 1+4=5

(2)

2. (a) What is a function prototype? 2
- (b) Explain the difference between parameter passing mechanisms—call by value and call by reference. $2+2=4$
- (c) Explain the 'passing arrays to function' with example. 3

UNIT—II

3. (a) Differentiate between time complexity and space complexity. Explain Big-O notation. $2+2=4$
- (b) Differentiate between a singly linked list and a doubly linked list. $2\frac{1}{2}$
4. (a) Write an algorithm to evaluate a postfix expression. 3
- (b) Define stack as a data structure. Explain the basic operations performed in a stack. $1+2\frac{1}{2}=3\frac{1}{2}$

UNIT—III

5. (a) What is meant by a complete binary tree? Explain how a tree may be represented using arrays. $2+3\frac{1}{2}=5\frac{1}{2}$
- (b) Write a short note on threaded binary trees. 3

D7/45

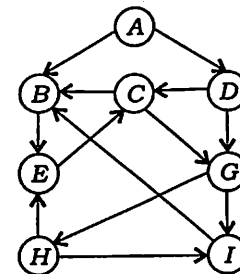
(Continued)

(3)

6. (a) Define a binary search tree. Write a function to search for an item k in a binary search tree pointed by t . $2+3\frac{1}{2}=5\frac{1}{2}$
- (b) List the advantages of AVL tree. 3

UNIT—IV

7. (a) Define spanning tree. 2
- (b) Consider the graph given below. Find out its depth-first and breadth-first traversal schemes : $4\frac{1}{2}$



8. Given the adjacency matrix of a graph. Write a program to calculate the in-degree and the out-degree of a node N in the graph. $6\frac{1}{2}$

UNIT—V

9. What are meant by divide and conquer algorithm design technique? Explain the working principle of quicksort and state its complexity. $2+3\frac{1}{2}+1=6\frac{1}{2}$

D7/45

(Turn Over)

10. (a) Write short notes on any *two* of the following : $2\frac{1}{2} \times 2 = 5$

(i) Linear probing

(ii) Quadratic probing

(iii) Double hashing

(b) Define a hash table.

$1\frac{1}{2}$
