

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

2 0 1 7

(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 one question from each Unit

UNIT—I

1. (a) What is an algorithm? Write an algorithm to find the largest value in an array. 1+3=4
- (b) Explain the different bitwise operators supported by C. 3½
- (c) State the difference between the library functions getch() and getchar(). 2

(2)

2. (a) Define recursion. What are the advantages of recursion over iteration? $1+2=3$
- (b) What is the difference between malloc() and calloc()? 2
- (c) Briefly explain how to pass structure to a function in C. $4\frac{1}{2}$

UNIT—II

3. (a) Explain abstract data type with example. 2
- (b) List the different characteristics of a linked list. 3
- (c) What is a circular linked list? 1
4. (a) Write an algorithm to convert an infix expression to its equivalent postfix expression. 4
- (b) What is a dequeue? Explain the different types of dequeues. 2

UNIT—III

5. (a) What is a strictly binary tree? How does it differ from a complete binary tree? $2+2=4$
- (b) Explain linked list representation of a binary tree. 2

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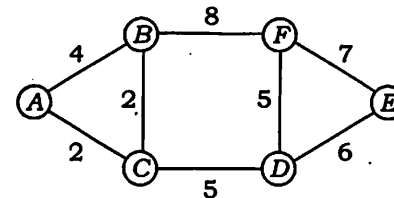
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(3)

- (c) Construct a binary search tree using the following elements : $2\frac{1}{2}$
23, 12, 18, 45, 76, 65, 34, 8, 55, 49
6. (a) Explain in brief the binary tree traversal methods. Write down the recursive function for each method. $3+2\frac{1}{2}=5\frac{1}{2}$
- (b) What are the different characteristics of a threaded binary tree? 3

UNIT—IV

7. (a) What is a graph? Explain in brief the two representations of a graph in computer. $1+3=4$
- (b) What is meant by incidence matrix of a graph? Explain with example. $2\frac{1}{2}$
8. (a) Write an algorithm to traverse a graph using depth-first search method. 3
- (b) Using Kruskal's algorithm, find the minimal spanning tree of the weighted undirected graph given below : $3\frac{1}{2}$



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(Turn Over)

UNIT—V

9. (a) Write a C function to implement binary search. State its time complexity. $3+1/2=3 1/2$
- (b) Explain how collisions are dealt with in open addressing method and chaining method. $1 1/2+1 1/2=3$
10. (a) Define hashing. Explain any two hashing methods. $1+2=3$
- (b) Write an algorithm to sort an array of n elements using selection sort. What is the time complexity of this algorithm? $3 1/2$
