

B.Sc. (Part-II) (CBCS Pattern) Sem-IV
USCST07 - 4 - Computer science Paper-I : Algorithm & Data Structures

P. Pages : 2

Time : Three Hours



GUG/W/22/12002

Max. Marks : 50

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- Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram wherever necessary.

Either :

1. a) Define data structure write an algorithm to search an element using binary search method. **5**
- b) What is stack? write an algorithm for PUSH and POP operation. **5**

OR

- c) Write an algorithm to swap odd indexed elements with even indexed elements. **5**
Original Array : $A \Rightarrow 15 \ 20 \ 12 \ 17 \ 23 \ 45$
After swapping : $A \Rightarrow 20 \ 15 \ 17 \ 12 \ 45 \ 23$
- d) Convert following infix expression into prefix and postfix expression. **5**
 $((A + B - C) * (D \wedge E / F)) + (J / (G \wedge H)) \wedge K$

Either :

2. a) Write an algorithm to find reverse of a number using recursion. **5**
- b) Write a recursive algorithm for Fibonacci series of N terms. **5**

OR

- c) Write an recursive algorithm to find power of a number $(a \wedge b)$. **5**
- d) Write an algorithm to delete an element from queue. **5**

Either :

3. a) Write an algorithm to insert an element in a sorted linked list. **5**
- b) What do you mean by linked list? Explain memory representation of linked list. **5**

OR

- c) Write an algorithm to find sum of all elements in given linked list. **5**
- d) Write an algorithm to insert an element after given location LOC. **5**

Either :

4. a) Write an algorithm to traverse binary tree using in order traversal. 5
b) Write an algorithm to search an element in binary tree T. 5

OR

- c) Write Depth-first search algorithm. 5
d) Explain- 5
i) Degree of Node ii) Directed graph
iii) Weighted graph iv) Adjacent Node
5. a) Write an algorithm to traverse a linear array. 2½
b) Define- 2½
i) Circular queue ii) Input restricted deque
c) What do you mean by circular linked list? Explain. 2½
d) Explain spanning tree. 2½
