BCA(Sem-IV) —
Design & Anal. of
Algor. (401)

# 2023

## (Session : 2021-24)

*Time : 3 hours*

*Full Marks : 70*

*Candidates are required to give their answers in their own words as far as practicable.*

*The figures in the margin indicate full marks.*

*Answer from **all** the Sections as directed.*

### Section – A

### (Compulsory)

1. Choose the correct answer of the following :

    $2 \times 10 = 20$

   (a) Which of the following sorting algorithms is the fastest ?

   (i) Marge sort

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( Turn over )

(ii) Quick sort

(iii) Insertion sort

(iv) Shell sort

(b) Merge sort uses which of the following technique to implement sorting ?

(i) Backtracking

(ii) Greedy algorithm

(iii) Divide and conquer

(iv) Dynamic programming

(c) Which of the following searching algorithm is fastest ?

(i) Binary search

(ii) Linear search

(iii) Jump search

(iv) All are equally fast

(d) Where is linear searching used ?

(i) Used all the time

(ii) When the list has only a few elements

(iii) When performing a single search in an unordered list

(iv) When the list has only a few elements and when performing a single search in an unordered list

(e) Binary Search can be categorized into which of the following ?

(i) Brute Force technique

(ii) Divide and conquer

(iii) Greedy algorithm

(iv) Dynamic programming

(f) To main measures of the efficiency of an algorithm are :

(i) Time and space complexity

(ii) Data and space

(iii) Processor and memory

(iv) Complexity and capacity

(g) Which of the following is a Divide and Conquer algorithm ?

(i) Bubble sort

(ii) Selection sort

(iii) Heap sort

(iv) Merge sort

(h) Identify the slowest sorting technique among the following :

   (i) Merge Sort

   (ii) Quick Sort

   (iii) Bubble Sort

   (iv) Selection Sort

(i) An algorithm is _____.

   (i) A problem

   (ii) A pocedure for solving a problem

   (iii) A real-life mathematical problem

   (iv) None of these

(j) Which of the following data stuctures is best suited for implementing a breadth-first search algorithm ?

   (i) Array

   (ii) Linked list

   (iii) Stack

   (iv) Queue

## Section – B

Answe any **four** questions of the following :

$$5 \times 4 = 20$$

2. Differentiate algorithm and pseudo code.

3. Differentiate between Iteration and Recusion technique.

4. Write an algorithm for Bubble sort.

5. Write an algorithm for Binary Search.

6. What is Divide and Conquer ?

7. What are the features important for "Correctness of an algorithm" ?

8. Create a decision tree for a student registration process.

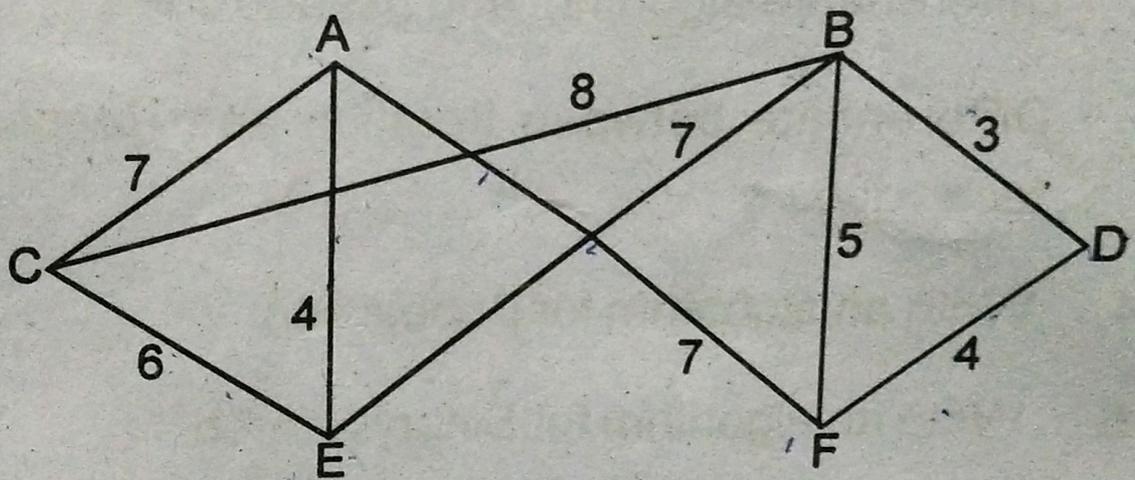9. What is Divide and Conquer technique ? Explain all three steps.

## Section – C

Answer any **two** questions of the following :

$$15 \times 2 = 30$$

10. Explain "Design" and "Analysis" of algorithm with suitable example.

## 11. Find out MST using Krushkal's algorithm.



## 12. Explain the meaning of correctness of algorithm.

## 13. Differentiate between BFS and DFS.

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