UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 4th Semester Examination, 2022

CC8-COMPUTER SCIENCE (41)

DESIGN AND ANALYSIS OF ALGORITHMS

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
All symbols are of usual significance.

1.   Answer any *five* of the following: 1×5 = 5

  (a) What is an Algorithm?

  (b) What are the types of algorithm efficiencies?

  (c) What is worst-case efficiency?

  (d) What is order of growth?

  (e) Define recurrence relation.

  (f) Define convex hull problem.

  (g) Define Knapsack problem.

  (h) Define max heap.

2.   Answer any *three* of the following: 5×3 = 15

  (a) Discuss the properties of Algorithm.

  (b) Explain the divide and conquer strategy.

  (c) What are the different applications of DFS and BFS?

  (d) Explain Greedy Technique.

  (e) Using Prim's algorithm, determine minimum cost spanning tree for the weighted
      graph shown below:
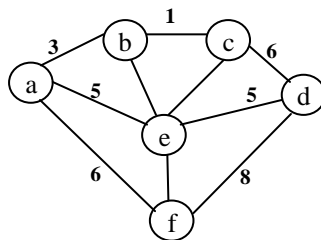
3. Answer any *two* of the following: 10×2 = 20

   (a) Explain Asymptotic Notations.

   (b) Write an algorithm for binary search. Further derive the algorithmic complexity of binary search.

   (c) Write an algorithm for quick sort. Further derive the algorithmic complexity of quick sort.

   (d) Define Dijkstra's Algorithm. Calculate the efficiency of Dijkstra's Algorithm.

   (e) Describe the Warshall's algorithm with example and analyze its efficiency.

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