

V Semester B.C.A. Degree Examination, February/March 2024
(NEP) (Freshers)
COMPUTER APPLICATIONS
Design and Analysis of Algorithms

Time : 2½ Hours

Max. Marks : 60

Instruction : Answer *all* the Sections.

SECTION – A

- I. Answer **any six** questions. **Each** question carries **2** marks. (6×2=12)
- 1) Define order of growth.
 - 2) Write an algorithm to compute gcd of two numbers.
 - 3) What do you mean by recursive algorithm ?
 - 4) What are the various factors that affect the execution time ?
 - 5) Write any two advantages of selection sort.
 - 6) What is brute force approach ?
 - 7) What is the concept of decrease and conquer methodology ?
 - 8) Write a short note on greedy algorithm.
 - 9) What is NP-class ?

SECTION – B

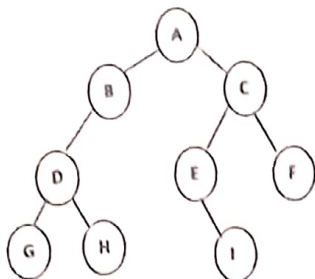
- II. Answer **any four** questions. **Each** question carries **6** marks. (4×6=24)
- 10) Explain the fundamentals of algorithmic problem solving.
 - 11) Write a general plan for analyzing non-recursive algorithm.
 - 12) Explain the TSP with a suitable example.
 - 13) a) What is knapsack problem ? 2
b) Write any two advantages and disadvantages of divide and conquer technique. 4
 - 14) Explain merge sort algorithm with an example.
 - 15) Write a program that implements Prim's algorithm to generate minimum cost spanning tree.

P.T.O.

SECTION – C

III. Answer **any three** questions. Each question carries **8** marks. (3×8=24)

- 16) Define algorithm. What are the criteria that an algorithm must satisfy ?
- 17) Explain asymptotic notations.
- 18) Compare and contrast BFS and DFS.
- 19) Define tree. Traverse the following tree in pre-order, post-order and in-order.



20) Obtain the shortest distance and shortest path from node 5 to node 1 in the following graph :

