

U.G. 3rd Semester Examination - 2021

BCA

Course Code : BBCACCHC303

Course Title : Introduction to Algorithm

Full Marks : 30

Time : 2 Hours

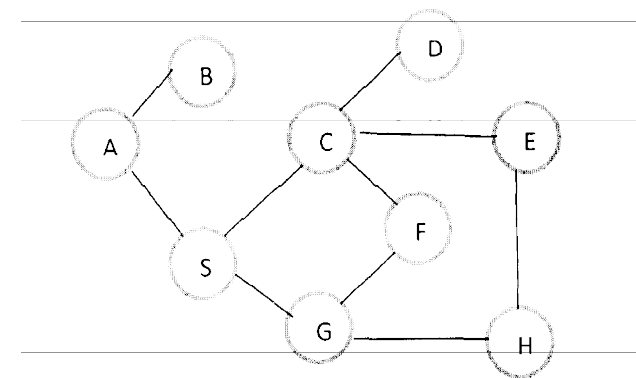
The figures in the right-hand margin indicate marks.

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

1. Answer any **ten** questions: 1×10=10
- Define binary search tree.
 - What is topological sorting?
 - Define Brute-force Algorithm.
 - Define knapsack.
 - What is vertex cover?
 - What is the main difference between DFS and BFS algorithm?
 - Give an example of indirect recursion.
 - Define nondeterministic polynomial.
 - Is it possible to perform Dijkstra's algorithm on an undirected graph?

- For what purpose Prim's algorithm is used?
- Which one is better, – $O(n)$ or $O(\log n)$? Give reason.
- What is state space?
- What is convex hull?
- Define minimum spanning tree.
- What is a forest?

2. Answer any **five** questions : 2×5=10
- Define best case, worst case and average case complexity.
 - Define recurrence with example.
 -



What is the output using DFS graph traversal for the above graph?

- d) What is the main difference between greedy and dynamic approach?
- e) Do you think Convex hull is useful? Justify.
- f) Do you think Prim's algorithm is a greedy approach? Justify.
- g) Write down the Kruskal's algorithm.
- h) Write the problem statement of fractional knapsack problem.

3. Answer any **two** questions : 5×2=10

- a)
 - i) Define subsequence.
 - ii) Find out the longest common subsequence between two given strings X and Y, where X= a b a a b a and
Y = b a b b a b. 1+4
- b)
 - i) What is the best case complexity quick sort?
 - ii) Write quick sort algorithm. 1+4
- c) Write and explain the Graham Scan algorithm.
