

BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)

B.Tech.Sem - IV IT :SUMMER- 2022

SUBJECT : APPLIED ALGORITHMS

Day : Wednesday

Time : 10:00 AM-01:00 PM

Date : 22-06-2022

S-24721-2022

Max. Marks : 60

N.B.:

- 1) All questions are **COMPUSLORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data if necessary.

Q.1 What is analysis of recursive algorithm? What is master theorem for recursive algorithm? Discuss the three cases of master theorem. [10]

OR

Q.1 What is asymptotic complexity of an algorithm? How do you calculate upper bounds and lower bounds? [10]

Q.2 Differentiate between greedy algorithm, dynamic algorithm and heuristic problem solving approaches. [10]

OR

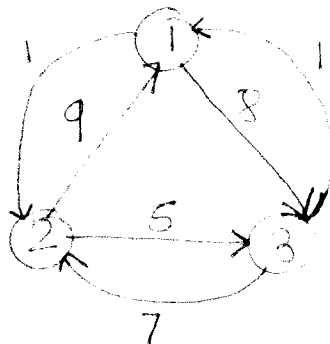
Q.2 Let there be a knapsack with capacity in $w = 15$. Let there be three items push profit and weight are given in the table. Find the optimal order for loading this items in given knapsack using Greedy approach. [10]

Items	Weight	Profit
1	8	24
2	9	18
3	5	20

Q.3 What is meant by backtracking? How does it helps solve problems? Write a recursive and non-recursive procedure for backtracking. [10]

OR

Q.3 Consider the graph shown below and find the shortest path using Floyd Warshall's algorithm. [10]



Q.4 Write the properties of a B tree of order M? Construct a B-Tree of order 3 by inserting numbers from 1 to 10. [10]

OR

Q.4 How to find the shortest path between every pair of vertices? Illustrate with suitable example. [10]

Q.5 State and prove Cook's theorem. What is P-reduction in Cook's theorem? [10]

OR

Q.5 What is the difference between class NP and class NP-complete? What are the different classes of NP-complete problems? [10]

Q.6 Write a program to implement quick sort using randomize algorithm. [10]

OR

Q.6 What is parallelism in computer science? Why parallel computing is not ideal to implement real-time systems? [10]