[Total No. of Questions: 09]

[Total No. of Pages: 2]

Uni. Roll No. .....

Program/ Course: B.Tech. (Sem 5th)
Name of Subject: Design and Analysis of Algorithms
Subject Code: BTCS-503
Paper ID: A2099

Time Allowed: 3 Hours

Max. Marks: 60

NOTE:

1) **Section-A** is **compulsory**
2) Attempt any **four** questions from **Section-B** and any **two** questions from **Section-C**
3) Any missing data may be assumed appropriately

Section – A

[Marks: 02 each]

Q1.

a) Distinguish between Algorithm and Psuedocode.
b) Write the various features of an efficient algorithm?
c) Define i) Feasible solution ii) Optimal solution.
d) What is meant by Divide and Conquer approach?
e) Compare breath first and depth first searching .
f) What are the graph traversal techniques?
g) State the Subset Sum problem.
h) Define 3 SAT problem.
i) What is approximation problem?
j) Explain FFT and its applications.

Section – B

[Marks: 05 each]

Q2. Explain the Graph – coloring problem. And draw the state space tree for m= 3 colors n4 =vertices graph.

Q3. State the best, average and worst case complexities of binary search for successful and unsuccessful search.

Q4. Discuss Backtracking and give the 4 Queens problem's solution.

Q5. Explain minimum spanning tree problem using prims and kruskal algorithms.

Q6. What is the relationship among P, NP and NP complete problems? Show with the help of a diagram.

Section – C

[Marks: 10 each]

Q7. How knapsack problem can be solved using 0/1 kanpsack and fractional knapsack techniques? Find an optimal solution to the knapsack instance n=7 objects and the capacity of knapsack m=15. The profits and weights of the objects are (P1,P2,P3, P4, P5, P6, P7)= (10, 5,15,7,6,18,3) (W1,W2,W3,W4,W5,W6,W7)= (2,3,5,7,1,4,1).

Q8. What are the various pattern matching algorithms? Explain Knuth-Morrie-Pratt algorithm with an example

Q9. Explain various asymptotic notations for an algorithm. Compare the performance of various sorting algorithms using these notations.

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