Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐ **Total No. of Pages : 02**

Total No. of Questions : 18

B.Tech.(CSE) (2011 Onwards) (Sem.–5)

DESIGN & ANALYSIS OF ALGORITHMS

Subject Code : BTCS-503

Paper ID : [A2099]

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Answer briefly :

1. What are the applications of Fast Fourier transform?
2. What do you mean by integer arithmetic?
3. What are approximation algorithms?
4. What is a minimal spanning tree?
5. How do you compare the performance of various algorithms?
6. What is polynomial time reduction?
7. Why bubble sort is so called?
8. Distinguish between deterministic and non-deterministic algorithms.
9. Give an example of dynamic programming approach.
10. What are the graph traversal techniques?

SECTION-B

11. Prove that if f1(n)=O(g1 (n)) and f2 (n)=O(g2(n)), then f1 (n)+f2 (n)= O(g1 (n) + g2 (n)).

12. What are greedy algorithms? What are their characteristics? Explain any greedy algorithm with example.

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

14. What is dynamic programming? How is this approach different from recursion? Explain.

15. Explain in detail quick sorting method. Provide a complete analysis of quick sort.

SECTION-C

16. Explain any pattern matching algorithm with example.

17. Discuss the strassen's matrix multiplication algorithm in detail. Also, give illustrative example to explain the efficiency achieved through this algorithm.

18. Extend the Dijkastra's algorithm to find All-pairs-shortest-path (APSP) problem.