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Total No. of Questions : 18

B.Tech. (CSE) (2012 to 2017) (Sem.–5)

DESIGN & ANALYSIS OF ALGORITHMS

Subject Code : BTCS-503

M.Code : 70536

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS 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 the following briefly :

1) What is asymptotic notation?

2) Define Big Oh.

3) What are the steps involved in proving a problem to be NP complete?

4) What are the applications of Fast Fourier transform?

5) How the Prim's algorithm is better in finding the Minimal spanning tree in comparison to the Kruskal's method?

6) What is the time complexity of the algorithm for finding all-pairs-shortest-path problem?

7) What are NP class problems?

8) What is the minimal spanning tree? What are its advantages?

9) What is a deterministic algorithm?

10) Distinguish between deterministic and non-deterministic algorithms.

SECTION-B

11) What is the relationship between the classes P and NP? Explain. (5)

12) Explain the Big -Oh computation for each of the following control structures : (5)

a) Sequencing b) If-then-else c) "for" loop

c) "While" loop e) Recursion

13) What do you analyze in an algorithm? What is the basis of analysis? Explain. (5)

14) Explain topological sort with an example. (5)

15) What are greedy algorithms? What are their characteristics? Explain any greedy algorithm with example. (5)

SECTION-C

16) Explain the KMP algorithm in detail with an illustrative example. (10)

17) Explain in detail quick sorting method. Provide a complete analysis of quick sort. (10)

18) Order the following functions by growth rate: N, $N^{1.5}$, N^2, N log log N, N $\log^2$ N, N log (N^2), 2/N, 2^N, $2^{N/2}$, 37, N^2 log N, N^3 Indicate which functions grow at the same rate. (10)

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.