Reg. No. : | | | | | | | | | | |

Question Paper Code: 41842

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fourth Semester

Information Technology

01UIT402 - ANALYSIS AND DESIGN OF ALGORITHMS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define Big O notation.
2. What do you mean by an algorithm?
3. List the general plan for analyzing the time efficiency of non - recursive algorithm.
4. Write general plan for analyzing non-recursive algorithms.
5. What are the principal strengths and weakness of the Brute-force approach?
6. Define Brute force algorithm.
7. List the important properties of heaps.
8. Define Warshall’s algorithm.
9. State subset sum problem.
10. Define NP Hard and NP Completeness.

PART - B (5 x 16 = 80 Marks)

11. (a) What is an algorithm? With a neat diagram, explain the various stages of algorithm design and analysis process. (16)

Or

(b) What are asymptotic notations? Explain in detail. (16)

12. (a) (i) Write a recursive algorithm to find sum of the first n cubes and obtain its time complexity. (10)

(ii) Suggest a general plan for analyzing the efficiency of recursive algorithms. (6)

Or

(b) Derive the recurrence equation for Fibonacci series. Perform complexity analysis for the same. (16)

13. (a) What are the differences between DFS and BFS? Solve topological sorting problem using DFS algorithm with an example. (16)

Or

(b) Give a suitable example and explain the depth first search algorithm. (16)

14. (a) (i) Define Heap. Explain the properties of Heap. (8)

(ii) With a simple example, explain heap sort algorithm. (8)

Or

(b) Define the three variations of transform and conquer algorithms. Construct an AVL tree for the list 5, 6, 8, 3, 2, 4, 7 by successive insertions. State four rotation types used in the construction of the AVL tree and explain the same. (16)

15. (a) (i) How does backtracking work on the N Queens problem with an example? (8)

(ii) Explain how traveling salesman problem can be solved using branch and bound method. (8)

Or

(b) How is dynamic programming applied to solve the traveling salesman problem? Explain in detail with an example. (16)
