NOVEMBER/DECEMBER 2020

MCS34 — DESIGN AND ANALYSIS OF ALGORITHMS

Time : Three hours   Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

1.   (a)   Illustrate the time complexity of algorithms.

Or

(b)   State any five mathematical functions and notations to explore the relationship among them.

2.   (a)   Describe the Travelling Salesperson Problem using the Greedy Method.

Or

(b)   Describe Huffman's algorithm with an example.

3.   (a)   Illustrate the method of backtracking with the 4-Queens problem.

Or

(b)   How will you generate search trees for all cliques problem? Illustrate with an example.

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4. (a) Write a pseudo code to give a randomised algorithm for detecting the majority element.

Or

(b) What do you mean by randomized algorithms? Describe any two randomized algorithms.

5. (a) Describe the comparison tree for sorting three elements and analyze the time complexity for sorting and searching.

Or

(b) Illustrate the use of adversary arguments for proving the lower bound in finding median.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. Explain the features and operations of RAM and illustrate with an example.

7. Illustrate how the matrix multiplication is carried out using Strassen's method with relevant example.

8. Explain in detail the chain matrix multiplication with relevant procedure.

9. Describe the features of bin packing method. Solve the bin packing problem using the first fit, best-fit, first-fit decreasing and best-fit decreasing heuristics.

    Capacity = 15, No. of objects = 5, Capacities of objects = (8, 11, 10, 4, 7).

10. What do you mean by the Branch and Bound technique? Explain the Assignment Problem with an example and explore the various search trees associated with it.

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