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Fourth Semester B.E. Degree Examination, June/July 2017 Design and Analysis of Algorithms

Time: 3 hrs. Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define algorithm. Explain asymptotic notations, Big O, big Omega, big theta notations. (08 Marks)
- b. Explain general plan of mathematical analysis of nonrecursive algorithms with example. (08 Marks)

OR

- 2 a. Define time and space complexity. Explain important problem types. (08 Marks)
- b. Illustrate mathematical analysis of recursive algorithm for towers of hanoi. (08 Marks)

Module-2

- 3 a. Explain concept of divide and conquer. Write merge sort algorithm. (08 Marks)
- b. Write a recursive algorithm for binary search and also bring out its efficiency. (08 Marks)

OR

- 4 a. Illustrate the tracing of quick sort algorithm for the following set of numbers:
25, 10, 72, 18, 40, 11, 64, 58, 32, 9 (08 Marks)
- b. List out the advantages and disadvantages of divide and conquer method and illustrate the topological sorting for the following graph.

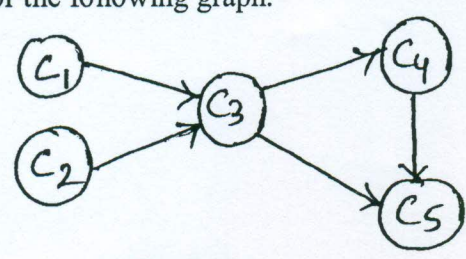


Fig.Q4(b) (08 Marks)

Module-3

- 5 a. Explain Greedy criterion. Write a Prim's algorithm to find minimum cost spanning tree. (08 Marks)
- b. Sort the given list of numbers using heap sort: 2, 9, 7, 6, 5, 8. (08 Marks)

OR

- 6 a. Write an algorithm to find single source shortest path. (08 Marks)
- b. Construct a Huffman tree and resulting code word for the following:

Character	A	B	C	D	-
Probability	0.35	0.1	0.2	0.2	0.15

Encode the words DAD and ADD. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.