C 63035

(Pages ; 2)

SECOND SEMESTER M.Sc. DEGREE E　　　　trunf;:; 2019

(CUCSS)

Computer Science

CSS 2C 01—DESIGN AND ANALYSIS OF ALGORITHMS

(2014 Admissions)

Time : Three Hours　　　　　　　　　　　　　　　　　Maximum ; 36 Weightag

Part A
Answer all *questions.*
Each question carries 1 weightage,

1. Give the names of two popular string matching algorithms

2. What is the best case time complexity of a sorting algorithm

3. Define Big-0 ratio theorem.

4. What are the drawbacks of dynamic programming?

5. Define 0/1 Knapsack problem.

6. What are the requirements that are needed for backtra,eking

7. What is the time complexity of a binary search algorithm?

8. List any two properties of NP problem.

9. What are memory functions ? State its uses,

10. Give two examples of divide-and-conquer method.

11. If $f(n) = 5n^2 + 6n + 4$, then prove that $f(n)$ *is* 0 (n^2),

12. State Cook's theorem.

(12 1 = 12 weighta$_g$e

Part B
Answer any six *questions.*
Each question carries 2 *weightage.*

13. What are Parallel Random Access Machines ?

14. Compare time complexity and space complexity of merge sot and ciuiJ sort.

15. What is brute-force method ? Explain how it can be applied ia string matching problem.

16. Briefly explain Strassen's Matrix Multiplication algorithm,

17. Write an algorithm to find the height of a binary tree.

18. Draw the decision tree for the 3-element insertion sort.

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19. E.q)h= the Prim's algorithm for finding the minimum spanning tree with an example.

20. A.e e complexity of BFS algorithm.

21. Whai. parallel prefix computation ? Explain its characteristics and applications.
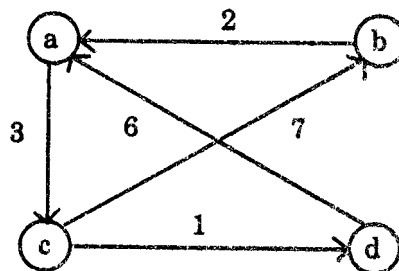
(6 x 2 .12 weightage)

Part C
Answer any **three** *questions.*
Each question carries **4** *weightage.*

22. Explai,q ttie method of comparing the order of the growth of two Danction.s using limits. Compare orde growth of following functions : (i) $\log_2 n$ and ➤ (ii) $(\log_2 n)^2$ and $\log_2 n^2$.

23. Apply thnis and Kruskal's algorithm to the following graph :
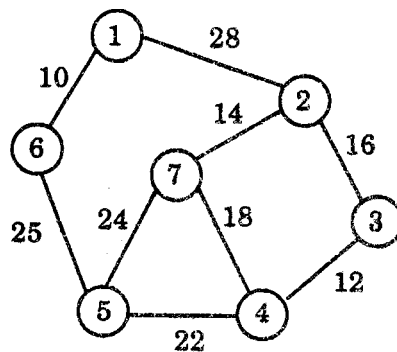
24. Write ;.;erge sort algorithm to sort the following numbers 14, 17, 18, 12, 9, 7, 11, 34, 21, ii. Deride t:7,e best and the worst case time complexity of merge sort algorithm.

25. Prove that satisfiability of Boolean formula in 3-Conjunctive Normal Form. (3-C1cF) is NP — Uorpete.

26. Appl *loyd's* algorithm to find all pairs shortest path for the graph given below :

27. Define Symmetry breaking. Describe how fast deterministic symmetry breaking can be achieved with an example.

(3 x 4 1.2 weightage)