

Question Paper Code: 54203A

B.E. / B.Tech. DEGREE EXAMINATION, JUNE 2021

Fourth Semester

Computer Science and Engineering

15UCS403- DESIGN AND ANALYSIS OF ALGORITHMS

(Regulation 2015)

Duration: 1:45 hrs

Maximum: 50 Marks

PART A

(Answer any Ten Questions 10 x 2 Mark = 20 Marks)

1. Design a recursive algorithm for computing 2^n for any nonnegative integer n that is based on the formula $2^n = 2^{n-1} + 2^{n-1}$ (CO1-U)
2. Define the various case efficiency analysis of an algorithm (CO1-U)
3. Define Algorithm Design Technique? Mention Some types. (CO1-U)
4. State the difference between Quick sort and merge sort. (CO2-U)
5. Write the pseudo code for Binary search algorithm (CO2-U)
6. Sort the list E,X,A,M in alphabetical order by bubble sort. Show the result of each iteration. (CO2-U)
7. Define Dynamic Programming and list out its features. (CO3-U)
8. What is principle of optimality? (CO3-U)
9. Define feasible and optimal solution. (CO3-U)
10. Define lower bound and list the various methods to calculate it? (CO4-U)
11. State and explain Weighted Graphs (CO4-U)
12. What is the complexity bubble sort. (CO4-U)
- What does dynamic programming have in common with divide-and-conquer? (CO1-U)
13. What is a principal difference between them?
14. What is maximum flow problem? (CO1-U)
15. What is blocking pair in stable marriage matching problem. (CO15-U)

PART – B

(Answer any Three Questions 3 X 10 = 30 Marks)

16. Discuss the mathematical analysis of recursive algorithm using a neat example. CO1 - APP (10)
17. Write a pseudo code for merge sort algorithm for sorting the following list P,R,O,G,R,A,M in alphabetical order. CO2 - APP (10)
18. Maximize $Z = f(x,y) = 3x + 2y$
subject to: CO3 - U (10)
 $2x + y \leq 18$

$$2x + 3y \leq 42$$

$$3x + y \leq 24$$

$$x \geq 0, y \geq 0 .$$

19. Construct state space search tree for solving the four queen's problem by back tracking and write its algorithm. CO4 - APP (10)
20. Explain how the board's symmetry can be used to find the second solution to the four-queens problem CO3 - App (10)