K24U 0184

Reg. No. : .....

Name : .....

Sixth Semester B.C.A. Degree (C.B.C.S.S. – OBE – Regular/ Supplementary/Improvement) Examination, April 2024
(2019 to 2021 Admissions)
Core Course
6B17BCA : DESIGN AND ANALYSIS OF ALGORITHM

Time : 3 Hours Max. Marks : 40

PART – A
Short Answer

Answer **all** questions : **(6×1=6)**

1. What is meant by algorithm design ?
2. When can a sorting algorithm be referred to as stable ?
3. What is the importance of algorithm analysis in decision making ?
4. What is meant by solving recurrences ?
5. What elements contribute to the reusability of algorithmic components within the framework of an algorithm's structure ?
6. What is the number of scalar multiplications in two n x n matrices ?

PART – B
Short Essay

Answer **any 6** questions : **(6×2=12)**

7. What is pseudocode ? Give an example.
8. State the principle of optimality. How does it influence the efficiency of dynamic programming approach ?

P.T.O.

9. Define the following related to backtracking.
   a) Live node.
   b) E node.
   c) Success node.
   d) Dead node.
10. What is asymptotic notation ?
11. What is referred as 'Time complexity' ?
12. How should control statements and iterative statements analysed in algorithm ?
13. What is meant by Huffman code ?
14. What is Prim's algorithm ? How can the time complexity of Prim's algorithm be optimized ?

PART – C

Essay

Answer **any 4** questions : **(4×3=12)**

15. What is randomization ? How does it help to improve the speed of Quick sort algorithm ?
16. Explain the significance of algorithm analysis.
17. How is substitution method applied for solving recurrences ? Show an example.
18. An array has exactly n nodes. They are filled from the set {0, 1, 2, ..., n – 1, n}. There are no duplicates in the list. Design an O(n) worst case time algorithm to find which one of the elements from the above set is missing in the array.
19. What are the advantages and disadvantages of Strassen's algorithm ?
20. What is a minimum spanning tree ? How does Kruskal's algorithm ensure that no cycles are formed ?

PART – D

Long Essay

Answer **any 2** questions : **(2×5=10)**

21. What considerations should be taken into account when making decisions prior to the design of an algorithm ?

22. Differentiate between dynamic programming approach and divide and conquer approach.

23. Explain Big O notation and Big omega notation in detail.

24. Using the divide and conquer approach to find the maximum and minimum in a set of 'n' elements. Also find the recurrence relation for the number of elements compared and solve the same.