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 × 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.

28/02/2023

K23U 0443

Reg. No. : .....

Name : .....

VI Semester B.C.A. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, April 2023
(2019 and 2020 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 an algorithm ?
2. What are recurrence relations ?
3. What is Amortized analysis ?
4. What is backtracking ?
5. Explain the big Oh notation.
6. What are the steps in the Substitution Method ?

PART – B
Short Essay

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

7. Explain the RAM model implementation in the analysis of algorithms.
8. What are the steps involved in Master's theorem ?
9. What is dynamic programming ?
10. What are the types of problem in backtracking ?
11. Define the terms Best case, Worst case and Average case time complexities.
12. What are the steps in developing an algorithm ?
13. What is the Quick sort algorithm ? What is its worst case complexity ?
14. What is knapsack problem ?

P.T.O.

PART – C
Essay

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

15. Explain the 8-Queens problem with example.
16. Write and explain Brute force string matching algorithm.
17. Compare breadth first search and depth first search techniques.
18. Define algorithm for binary search.
19. How to find optimal solution using Greedy algorithm ?
20. Write the algorithm for Strassen's matrix multiplication.

PART – D
Long Essay

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

21. Explain the types of substitution to solve recurrence relation.
22. Describe the Knuth-Morris-Pratt matching algorithm with example.
23. Solve T(n) = 2T(n/2) + n using Master's theorem.
24. Explain Kruskal's algorithm with an example.

K22U 0343

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VI Semester B.C.A. Degree (CBCSS – OBE – Regular) Examination, April 2022
(2019 Admission)
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. Define Algorithm.
2. How many multiplications are used in Strassen's Matrix Multiplication algorithm ?
3. Which method is used for 8 queen's problem ?
4. What do you mean by best case of an algorithm ?
5. What is the time complexity of Prim's algorithm ?
6. Define backtracking.

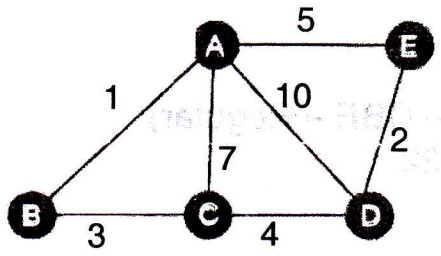
PART – B
Short Essay

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

7. What are average case and worst-case analysis of an algorithm ?
8. Define Iteration method for solving a recurrence.
9. Write down algorithm for Binary search.
10. Explain any one sorting algorithm to sort an array.
11. What is the importance of algorithm analysis ?
12. Define Big oh notation.

P.T.O.

13. Calculate the cost of MST of the given graph using Kruskal's algorithm.



14. Write down Prim's algorithm.

PART – C
Essay

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

15. What are the steps in developing algorithm ?
16. Explain Pseudo code method of specifying an algorithm with example.
17. What is greedy algorithm ? Explain with one example.
18. What is time complexity of an algorithm ?
19. Explain problem solving using master's theorem.
20. What is Huffman coding ? Explain.

PART – D
Long Essay

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

21. Explain Divide and Conquer approach of an algorithm.
22. Explain Asymptotic Notations.
23. What is Recurrence Relation ? Explain Substitution method for solving recurrence with example.
24. Explain Strassen's Matrix Multiplication.
