

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET A

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024**

Semester : Semester III - 2022

Course Code : CSE2007

Course Name : Design and Analysis of Algorithms

Program : B.Tech.

Date : 05-JAN-2024

Time : 9:30AM - 12:30 PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

4 X 5M = 20M

1. List the different basic mathematical efficiency classes and explain each in one sentence.
(CO1) [Knowledge]
2. List the steps in the form of algorithm in order to sort the elements using decrease and conquer technique
(CO3) [Knowledge]
3. Write down the sorting algorithm which sorts the given unsorted array from beginning of the array using brute force technique
(CO2) [Knowledge]
4. Explain the general method of backtracking in detail.
(CO5) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

5. Demonstrate how binary search is efficient when compared to sequential search
(CO2) [Comprehension]
6. Apply quick sort to the elements C,H,A,K,R,A,V,A,R,T,H,Y
(CO3) [Comprehension]
7. Write any one cycle removing algorithm
(CO4) [Comprehension]

8. Apply backtracking technique to 4 * 4 chessboard for N-Queen's problem .

(CO5) [Comprehension]

9. Explain the general method of dynamic programming and greedy technique. Also mention atleast 3 differences between the same.

(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 15M = 30M

10. Obtain the optimal solution for the binary knapsack problem using dynamic technique. Assume Maximum Knapsack capacity is 5Kg.

Item	Weight	Profit
1	2	15
2	3	20
3	4	30
4	2	25

(CO4) [Application]

11. Construct Huffman tree for the following data and obtain its Huffman code.

Characters	A	B	C	D	E	_
Probability	0.4	0.3	0.25	0.2	0.45	0.15

Encode the Text CAB_DAC.

Decode the text whose encoding is 011101000000110111

(CO4) [Application]