

Total number of printed pages-3

44 (3) BCA-HC-3026

2022

( Held in 2023 )

## DATA STRUCTURE AND ALGORITHM

Paper : BCA-HC-3026

Full Marks : 60

Time : Three hours

**The figures in the margin indicate full marks for the questions.**

Answer **any six** questions.

1.

~~(a)~~ Briefly explain memory representation of 2D arrays. Write address translation function for 2D arrays. 6

~~(b)~~ Each element of an array ARR [10] [10] requires 4 bytes of storage. Base address of ARR is 500. Determine the location of ARR [3] [5] when the array is stored as (a) row major, (b) column major. 2+2=4

Contd.



2.

(a) Draw a before and after diagram and describe the main action of deleting a node from middle position of single linked list. 5

(b) What is double linked list? Explain the cases of deletion for double linked list. 5

3.

(a) Explain stack overflow and underflow conditions. 5

(b) Show the following postfix arithmetic expression evaluation in stack : 5

$396 - \wedge 62 / 5 * + 73 \%$

4. (a) Explain the non-recursive function for preorder traversal. 5.

(b) Write the differences between BFS and NFS. 5

5.

(a) What is binary search tree? Write an algorithm to insert a node in binary search tree. 5

(b) Describe the concept of binary search technique with a suitable example. 5



6. (a) Sort the following data using selection sort : 5

35, 63, 31, 89, 70, 90, 92

(b) What is a quicksort ? Give its algorithm. How you can say that it is based on the concept of divide and conquer ? Explain. 5

7. (a) What is complexity of algorithm ? What are the cases for complexity of algorithm ? 5

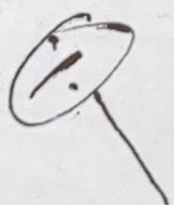
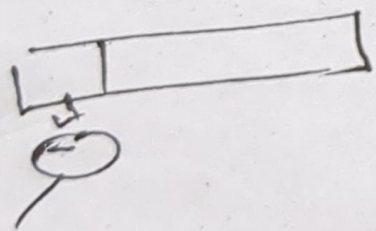
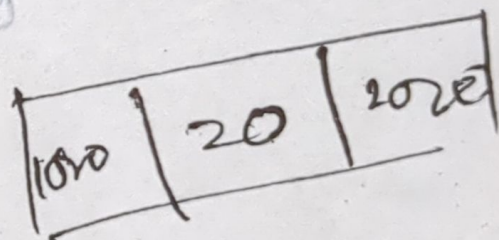
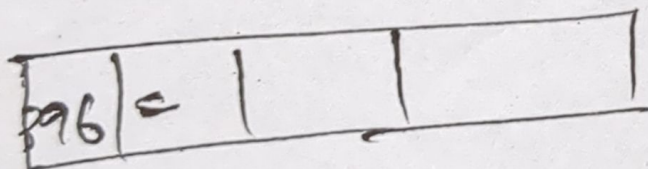
(b) What is asymptotic analysis of an algorithm ? What are asymptotic notations ? 5

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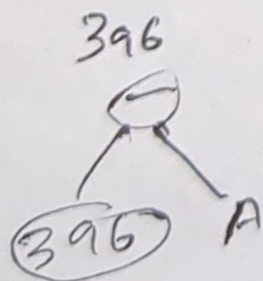
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31, 35, 63, 70, 89, 90, 92

73



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