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 – ∧ 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