



'সমানো মন্ত্র: সমিতি: সমানী'

**UNIVERSITY OF NORTH BENGAL**  
B.Sc. Programme 4th Semester Examination, 2022

**DSC1/2/3-P4-COMPUTER SCIENCE**

**DATA STRUCTURES**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
All symbols are of usual significance.*

**GROUP-A**

1. Answer any *five* questions: 1×5 = 5
- (a) Define data structure.
  - (b) Give any two example of non-linear data type.
  - (c) What is base address?
  - (d) What is postfix notation of an expression?
  - (e) Write any two applications of stack in computer architecture.
  - (f) Write any two applications of Queue in computer architecture.
  - (g) The in-order traversal of a BST will present the elements in which order?
  - (h) Define priority Queue.

**GROUP-B**

2. Answer any *three* questions: 5×3 = 15
- (a) State the advantages of linked-list over array.
  - (b) Write an algorithm for binary search and explain it with a suitable example.
  - (c) Write an algorithm for postfix evaluation and explain it with a suitable example.
  - (d) Write an algorithm to insert a node in BST.
  - (e) What are the drawbacks of array implementation of Queue? Explain with an example.

**GROUP-C**

3. Answer any *two* questions: 10×2 = 20

(a) Define stack. Write an algorithm to implement a stack using linked list. 2+3+5  
Convert the following expression to its postfix equivalent.

(b) Define array. What is sparse matrix? Give example. State the advantages and disadvantages of recursion. 2+2+3+3

Analysis the complexity of linear search.

(c) Consider the following array 5+5

9	2	1	8	2	5	6
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Sort the above array using insertion and selection sort.

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