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S.Y.B.Sc. (Computer Science) (NCF-NEP) (Sem.-III) Examination March - 2026

Data Structure Using C++ (Major-1-CS-303)

Time: 1 Hour] **[Total Marks: 25**

સૂચના : / Instructions
(1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book

Seat No.:

Student's Signature

Q.1. A. Answer the followings. (Any Four) **04**

1. What is a data structure?
   a. A programming language
   b. A collection of algorithms
   c. A way to store and organize data
   d. A type of computer hardware

2. Identify the data structure which allows insertion at both ends but deletion at only one end.
   a. Input restricted dequeue b. Stack
   c. Output restricted dequeue d. Circular queue

3. A variant of linked list in which last node of the list points to the first node of the list is?
   a. Singly linked list b. Doubly linked list
   c. Circular linked list d. Multiply linked list

4. If the number of records to be sorted is small, then _____ sorting can be efficient.
   a. Merge b. Heap
   c. Selection d. Bubble

5. What is a full binary tree?
   a. Each node has exactly zero or two children
   b. Each node has exactly two children
   c. All the leaves are at the same level
   d. Each node has exactly one or two children

B. Answer the followings in short. (Any Four) **04**

1. What do you mean by self-referential structure?
2. Convert the given infix notation into its equivalent prefix notation: (A*(B+C)/D-E)
3. What is the disadvantages of linked list?
4. What do you mean by sorting? List out different types of sorting technique.
5. Define binary tree.

Q.2. Answer the following questions in detail.

A. What is a stack? Why is a stack known as a LIFO structure? Explain the push, pop, and display operations. Write algorithms for them. **07**

OR

A. Define linked list. List out different types of linked list. Explain circular singly linked list in detail. **07**

B. Define Queue. List various types of Queue. Explain simple queue with its insertion and deletion operations. **05**

Q.3. Answer any one. **05**

A. What is algorithm analysis? Explain average case, best case and worst case.

B. Write a detailed note on BST.

C. Write a note on binary search.