



RAN-2411001103010001

B.Sc. (IT) (NEP) (Sem. III) Examination November - 2025
Data Structures (Major - 1)(Paper - 303)

[Total Marks: 50

સૂચના : / Instructions

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

Seat No.:

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Student's Signature

- Q-1. [A] Define the following terms [Any Five] [05]**
- (1) Binary Search Tree
 - (2) IRDQ
 - (3) Zag-Zig case
 - (4) Space complexity
 - (5) Row Major Order
 - (6) Leaf Node
- Q-1. [B] Answer following questions in short [Any Five] [05]**
- (1) How to delete a leaf node in binary tree?
 - (2) What are the applications of queue.
 - (3) What are the main applications of linked list?
 - (4) Create an expression tree for $B + K * J + Y$
 - (5) What is static hashing?
 - (6) Why circular linked list is not having NULL link?
- Q-2. [A] Answer the following questions in detail [Any Two] [10]**
- (1) Write an algorithm to convert an infix expression to postfix expression.
 - (2) Explain hashing technique in detail. Create any hash function to map search key values to bucket address. Explain with an example.
 - (3) What is AVL tree? How to solve left right and right left case? Explain with an example.
- Q-2. [B] Answer the following questions in brief [Any Two] [06]**
- (1) How to represent polynomial with singly linked list?
 - (2) What is a circular queue? How to delete an element in circular queue?
 - (3) Explain insertion sort with an example.
- Q-3. [A] Answer the following questions in detail [Any Two] [10]**
- (1) Create a binary search tree for these values: 40, 30, 50, 10, 60, 70, 100, 20. Perform the Pre-order traversal of this tree.
 - (2) What is Big-Oh notation? Write Big-oh notation complexities for few sorting techniques. Which algorithm is performing well in giving less time execution?
 - (3) Convert this infix expression into postfix notation with stack method.
 $(P + K) - (L + J / T * V) / G * N$

- Q.3. [B] Answer the following questions in brief [Any Two] [6]**
- (1) What is hash table? How to resolve hash collision?
 - (2) Evaluate this postfix expression: 35, 10, +, 4, *, 5, /
 - (3) Perform radix sort on: 39, 50, 64, 78, 97, 200, 53, 72
- Q.4. [A] What is a binary search? Search 30 from following set of values: 10, 20, 30, 40, 60, 70, 80, 90, 100. Show all the steps. [05]**
- OR**
- Q.4. [A] Create a min heap tree and then perform heap sort on: 30, 40, 20, 10, 80, 2, 5**
- Q.4. [B] What is threaded binary tree? [03]**
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