Printed page: 02

Subject Code: ACSE0301/AMICSE0301/ACSEH0301

Roll No: | | | | | | | | | | | | |

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute)
Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Luck now

Course B.TECH/M.TECH (INT) Branch: CSE/M.TECH (Int.) CSE/CS/CSE (R)/IT/AIML/DS/AI
Semester THIRD Sessional Examination: FIRST
Subject Name: DATA STRUCTURES Year- (2022-2023)
Time: 1.15Hours Max. Marks: 30

General Instructions:

- *This Question paper consists of 02. pages& 05 questions. It comprises three Sections -A, B, &C. You are expected to answer them as directed.*
- *Section A–Q. No- 1 is of one 1 mark each & Q. No- 2 carries 2 marks each.*
- *Section B- Q. No- 3 carries5 marks each.*
- *Section C -Q.No-4 &5carries6markseach.Attempt any one part a or b*

SECTION – A [08 Marks]

1. All questions are compulsory- (4×1=4)
   a. Differentiate between Primitive and Non Primitive Data Type (1) CO1
   b. Define Time and Space Complexity (1) CO1
   c. Define Asymptotic notations (1) CO1
   d. Define Sparse Matrix (1) CO1

2. All questions are compulsory- (2×2=4)
   a. Find the address of integer type element A [2, 1] in Row and Column Major Order Array if the base address is 4000. Given Size of Array[10][10] (2) CO1
   b. Define Algorithm and its properties (2) CO1

SECTION – B [10Marks]

3. Answer any two of the following- (2×5=10)
   a. Define Hashing, Hash table, Hash Function. List different types of hash Function. Explain any Hash Function with example. (5) CO1
   b. Write down the algorithm for Insertion Sort along with its complexity. Also list characteristic of Insertion sort (5) CO1
   c. Discuss classification of Data Structures in Detail (5) CO1

SECTION – C

[12Marks]

4 Answer any one of the following- (1×6=6)

a. Write down an algorithm/function for Quick Sort. Implement Quick Sort on 5,3,8,9,1,7,0,2,6,4 (6) CO1

b. Differentiate between Linear and Binary Search
Write down the algorithm for Binary Search.
Implement Binary Search on
9, 12, 24, 30, 36, 45, 75. Search given item 45 in the array. (6) CO1

5. Answer any one of the following- (1×6=6)

a. Write down the algorithm for Merge Sort. Implement merge sort on 99,6,86,15,58,35,86,4,0 (6) CO1

b. Write down algorithm for Bubble sort. Implement Bubble sort on the given Array. 64, 65, 52, 31, 26 . Show all passes and their steps. (6) CO1

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute)

Affiliated to Dr. A.P. J. Abdul Kalam Technical University, Uttar Pradesh, Lucknow

Course: B.Tech Branch: CSE/IT/M.Tech(Int)/AI/DS/AIML/CS/CSR

Semester: III **Sessional Examination: II^nd**

Subject Name: Data Structure **Year- (2022- 2023)**

Time: 1.15 Hours **Max. Marks: 30**

General Instructions:

- *This Question paper consists of 2 pages & 5 questions. It comprises three Sections -A, B, &C. You are expected to answer them as directed.*
- *Section A –Q.No- 1 is of one 1 mark each & Q. No- 2 carries 2 mark each.*
- *Section B- Q. No- 3 carries 5 marks each.*
- *Section C - Q.No-4 & 5 carries 6 marks each. Attempt any one part a or b*

SECTION – A [08Marks]

1. All questions are compulsory- (4×1=4)

a. State the use of header node in linked list. (1) CO2

b. Discuss priority queue? (1) CO3

c. Define push and pop. (1) CO3

d. Briefly discuss underflow situation in Queue. (1) CO3

2 Attempt all parts (2×2=4)

a. What do you understand by circular linkedlist? (2) CO2

b. Construct an algorithm to insert an element in a Queue. (2) CO3

SECTION – B [10Marks]

3 Answer any two of the following- (2×5=10)

a. Distinguish Array from Linked-List. List out the advantage and disadvantage of linked-list. CO2

b. What do you understand by polish notation? Convert the given expression into prefix expression using polish notation. A-B(C+D)+E/F. CO3

c. Convert the below infix expression into postfix using stack. CO3

A+B^C-D(E-F)+G/H

SECTION – C

[12Marks]

4 **Answer any one of the following-** (1×6=6)

a. Compare Iteration and Recursion? Write a recursive algorithm of Tower of Hanoi with n=20 disks. Also find out the complexity of it. CO2

b. Give two examples where the concept of stack is used in computers. Evaluate the given postfix expression and findthe solution. CO3

4 3 2 * + 12 6 / + 3 -

5 **Answer any one of the following-** (1×6=6)

a. Define singly Linked list? Write a program to insert and delete an element in the linked list using Python. CO2

b. Add the given polynomial and represent it using Linked-List. CO2

$11x^5 + 6x^2 + 14$

$7x^6 + 5x^3 - 2x^2 - 12$

Write a program using Python to implement Fibonacci series.