Progressive Education Society's
Modern College of Arts, Science & Commerce
(Autonomous), Ganeshkhind, Pune – 16
End Semester Examination: Nov/Dec 2023
Faculty: Science and Technology

Program:	**BCA**	**Semester: III**		
Program(Specific):	**BCA(Science)**		**SET:**	**A**
Class:	**SYBCA**		**Course Type:**	**CC**
Name of the Course:	**Data Structures**		**Max. Marks:**	**70**
Course Code:	**23-BCA-231**		**Time:**	**3hours**

Instructions to Candidates: -

1. *There are 4 sections in the question paper. Write each section on a separate page.*
2. *All Sections are compulsory.*
3. *Figures to the right indicate full marks.*
4. *Draw a well labelled diagram wherever necessary.*

SECTION: A

Q1) Multiple choice questions. [5*1=5]

I) ADT stands for _____.

a) Abstract Data Type   b) Advance Data Type

c) Advance Digital Type   d) Abstract Digital Type

II) Stack is a _____.

a) LIFO   b) FIFO   c) FILO   d) LILO

III) Which of the following is not an operation of array?

a) Create   b) Insert   c) Store   d) Retrieve

IV) Which element chosen as pivot will give best case behaviour in Quick sort?

 a) First element   b) Smallest element   c) Middle element   d) Median

V) A linked list is.

a) Random access data structure   b) Sequential access data structure

c) Both of the above   d) None of the above

b) Answer the following in one or two sentences. [5*1=15]

a)   Define algorithm.

b)   What is tree?

c)   Define an array.

d)   What is circular linked list?

e)   Define stack.

SECTION: B

Q2) Attempt ANY FIVE the following. [5*3=15]

a) State the difference between linear and non-linear data structures?

b) Define following terms in tree:

1) Node   2) leaf   3) ancestor   4) siblings

c) Write an algorithm of linear search.

d) Write a short note on queue?

e) Define linked list.

f) Explain BFS?

SECTION: C

Q3) Attempt ANY FIVE the following. [5*4=20]

a) Explain binary search and linear search and write its advantage and disadvantages.

b) Write a note of time complexity and write its examples.

c) Explain bubble sort with an example.

d) Explain insertion sort with examples and write its efficiency.

e) Explain difference between an array and link list.

f) Define priority queue and write its types.

g) List the applications of trees.

SECTION: D

Q4) Attempt ANY FIVE the following. [5*5=25]

a) Explain Quick sort with algorithm and example.

b) What are the four types of linked list? Illustrate with diagrams.

c) Explain binary search algorithm with efficiency and write its advantages and disadvantages.

d) What is circular queue and explain the need for the circular queue.

e) What do you mean by traversal? Explain the different types of traversals.

f) Explain asymptotic notation and its types.

g) Explain graph with its types and also write its application.