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

Program: B.B.A.(Computer Application) **Semester: III** **SET: B**
Program (Specific): BBACA07 **Course Type: Core**
Class:SY BBA(CA) **Max.Marks: 70**
Name of the Course: Data Structures
Course Code: 23-BBACA232 **Time:2:30Hrs**
Paper: I

Instructions to the candidate:

i) All the questions are compulsory.
ii) Figures to the right indicate full marks.
iii) Draw diagram wherever necessary

Q1) Solve the following Multiple-Choice Questions **[1X10=10 Marks]**

a) int * ptr is which type of pointer?

i) integer ii) character iii) float iv) real

b) What is the size of int a[2] array?

i) 4 bytes ii) 2 bytes iii) 20 bytes iv) 40 bytes

c) What is the best case time complexity of insertion sort?

i) O(n) ii) O(n)2 iii) O(n)3 iv) O(n)4

d) Which one of the following is the process of inserting an element in the stack?

i) push ii) insert iii) add iv)take

e) Which of the following is the postfix expression?

i) A+B*C ii) AB++*C iii) A+B+CD+++ iv) ABC+*

f) A list of elements in which enqueue operation takes place from one end, and dequeue operation takes place from one end is_____

i) Queue ii) Stack iii) Binary tree iv)Linked list

g) A _____ binary tree contains 2 branches.

i) strictly ii) almost iii) left skewed iv) right skewed

h) A __ graph does not have cycle

i) acyclic ii) cyclic iii) complete iv) incomplete

i) Which one of the following is the correct way to increment the rear end in a circular queue?

i) (rear+1) % max ii) rear =rear+1 iii) (rear % max) + 1 iv) (rear % max) + 5

j) Which one of the following is not the application of the Queue data structure?

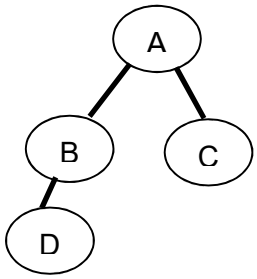
i) Resource sharing ii) Data transfer iii) Load balancing iv) Symbol balancing

Q2) Answer <u>ANY</u> <u>TEN</u> of the following: **[2X10= 20 Marks]**

a) Write a node structure of a doubly linked list.
b) Define Graph
c) What is a strictly binary tree?
d) State any one example of prefix notation.
e) What is a binary search tree?
f) Write LL rotation of AVL tree?
g) What is in-order of a binary tree?
h) What do you mean by DFS of graph?
i) What is a linear path?
j) Define stack.
k) Define a doubly ended queue.
l) Write an algorithm for binary search method.

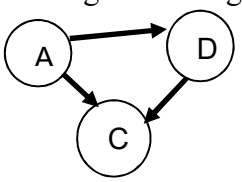
Q3) Answer <u>ANY FOUR</u> of the following: **[4X5=20 Marks]**

a) Write a function in C language to display the singly linked list.
b) Write a function in C language to pop integer value in stack (using static implementation).
c) Write a recursive function in C language to display preorder of binary search tree.
d) Convert following infix operations to postfix.
A+B*C-D
e) Create binary search tree for following data.
56,767,23,87,3,5
f) Write preorder of following binary search tree.

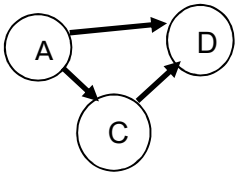


Q4) Answer <u>ANY</u> <u>FOUR</u> of the following: **[4X5=20 Marks]**

a) Sort the following data using heap sort algorithm.
3,67,23,54,9
b) Write algorithm to insert data on linear queue.
c) Evaluate the following postfix operation.
AB+X- values of variables are A=2, B=2, X=1
d) Write indegree/ outdegree and total degree of following graph.



e) Write BFS of following graph.



f) Sort the following data using insertion sort.
2,176,9,10,23