

DEPARTMENT OF COMPUTER SCIENCE
GUJARAT UNIVERSITY
MCA SEM I
Subject: Object Oriented Concept and Programming
Sessional Examination - II

27th December, 2023

Time: 60 mins
Max. Marks: 20

Answer the followings. (Any Ten)

20

- 1) Mention the advantages of inheritance.
- 2) Explain the statement "The private members of the base class are indirectly available to the derived class".
- 3) Briefly explain access control in inheritance.
- 4) Does following code generate output? Justify your answer.

```
#include<iostream>
using namespace std;

class A
{
    int x;
public:
    void setX(int i) { x = i; }
    void print() { cout << x; }
};

class B : public A
{
public:
    B() { setX(15); }
};

class C : public A
{
public:
    C() { setX(25); }
};

class D : public B, public C {
};

int main()
{
    D d;
    d.print();
    return 0;
}
```

- 5) What is runtime polymorphism? Why we required virtual function?
- 6) In following code, does virtual function required? Justify your answer.

```
class BaseClass
{
public:
    BaseClass()
    {
        cout << "BaseClass
        constructor ..." << endl;
    }
    ~BaseClass()
    {
        cout << "BaseClass destructor
        ..." << endl;
    }
};

class DerivedClass : public
BaseClass
{
public:
    DerivedClass()
    {
        cout << "DerivedClass
        constructor ..." << endl;
    }
    ~DerivedClass()
    {
        cout << "DerivedClass
        destructor ..." << endl;
    }
};

void main()
{
}
```

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```
BaseClass* ptrBase;  
ptrBase = new DerivedClass();  
delete ptrBase;  
getchar();  
}
```

- Q1) What is abstract class? What is pure virtual function? How to declare it and advantage of having it in base class?
- Q2) List out I/O mode of opening file. Briefly write about each.
- Q3) Which function are use to read and write in binary file? Write syntax for both.
- Q4) Explain the syntax seekg() and seekp() methods. What value/values we can pass in arguments?
- Q5) List out different manipulators and write syntax to define user defined manipulator.

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Department of Computer Science
Gujarat University
MCA theory examination
Semester I

Subject: Data Structures
Total Marks: 30

Time: 1.5 hours

- Q1. What are the two ways in which trees can be stored in the memory of the computer? What are disadvantages of storing using array?
Q2. Draw expression tree for the following:
i. $a^*(b+c) + ((d+e*f)*g)$
ii. $a+b/c-d*e+f$

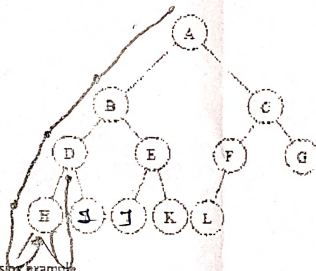
[5]
[4] 12

- Q3. Prove that preorder traversal and postfix expression of expression tree is prefix and postfix equivalent of that expression

[03] 12

Q4. Write preorder, postorder and inorder traversal of given binary tree

[03] 12



- Q5. Explain method of postfix evaluation using stack using example

[5]

- Q6. Write algorithm for infix to postfix conversion using stack

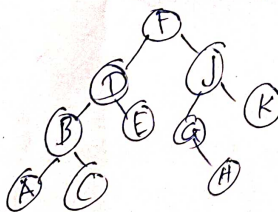
[5]

- Q7. Draw binary search tree for given data:
3, 7, 90, 12, 34, 55, 1, 2, 55, 100, 400, 200, 10
Q8. If the preorder and inorder traversal of the tree are as follows, draw the tree

[2]

[2]

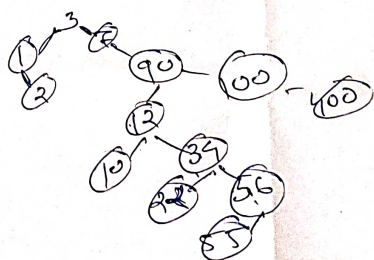
Inorder: $F \rightarrow D \rightarrow B \rightarrow A \rightarrow C \rightarrow E \rightarrow J \rightarrow G \rightarrow I \rightarrow H \rightarrow K$
Preorder: $F \rightarrow D \rightarrow B \rightarrow A \rightarrow C \rightarrow E \rightarrow J \rightarrow G \rightarrow I \rightarrow H \rightarrow K$



$a + b/c - d * e + f$

(F)

$A * B ((C * D) (A + B (C * D)))$



DEPARTMENT OF COMPUTER SCIENCE
GUJARAT UNIVERSITY
MCA I
Subject: Introduction to Python Programming
Sessional Examination – II

Date: 29/12/2023

Time: 1 hr 30 min
Max. Marks: 25

Q1. Explain following terms: (Any Four)

- (1) Constructor
- (2) super()
- (3) with statement
- (4) Sort() vs argsort()
- (5) Protected Members

08/2

Q2. Attempt the following Questions. (Any Three)

- (1) What is inner class? How we can create an object of inner class?
- (2) Explain Abstract classes and Methods.
- (3) Explain the difference between Runtime and Compile time Polymorphism.
- (4) Explain the difference between array using Array Module and array using Numpy Module.

09/3

Q3. Write a note on followings: (Any Two)

- (1) What is inheritance? Explain different types of inheritance with examples.
- (2) Explain the difference between Abstraction and Encapsulation with some real time examples.
- (3) What is Operator Overloading? How we can achieve Operator Overloading in python. Give a specific example code or pseudo code explaining Operator Overloading.

08/4