Sample Question Format

KIIT Deemed to be University
Online Mid Semester Examination(Autumn Semester-2020)

Subject Name & Code: OOP (IT-2005) **Applicable to Courses: 3rd Sem B.Tech**

Full Marks=20 **Time:1 Hour**

SECTION-A(Answer All Questions. All questions carry 2 Marks)

Time:20 Minutes **(5×2=10 Marks)**

Question No	Question Type(MCQ/SAT)	Question	Answer Key (if MCQ)	COMapping
Q.No:1(a) i	SAT	Explain how an array of objects can be initialized using parameterized constructor ? Give suitable code. [1+1]		2
ii	SAT	Can we pass objects as function arguments ? Explain with the help of an example. [1+1]		2
iii	SAT	What is the concept of data hiding ? What are its advantages? [1+1]		1
iv	SAT	Is it possible to access private data members without using member function ? If yes, explain the procedure with an example. [1+1]		2

Q.No:1(b) i	MCQ	Q1. What will be the output of the given code execution?
		#include <iostream>
		using namespace std;
		class alpha
		{
		alpha() { cout << "Constructor called"<<endl; }
		~alpha(){cout<<"Destructor called";}
		};
		int main()
		{
		alpha t1;
		return 0; }
		
		A. Constructor called Destructor called
		B. Constructor called
		Destructor called
		C. Compile time error
		D. Segmentation fault
			C	4&6

ii	MCQ	To ensure that every object in the array receives a destructor call, always delete memory allocated as an array with operator _____ . A. destructor B. delete	C	1&4

		C. delete[] D. free[]		

iii	**MCQ**	Q6. What will be the output of the given code execution
		`class Test { int a; Test(int x) { a=x; } ~Test() { cout<<"Private destructor\n"; } public: void disp() { Test(20); cout<<"\na="<<a<<endl; } };`
		`int main() { Test *p; p->disp(); return 0; }`
		A. Compile error
		B. Runtime error
		C. a=20 and private destructor
		D. a=20 and Runtime error
		E. Private destructor and Runtime error
			E	4&6

iv	**MCQ**	What will be the output of the given code execution?
		`class Test { int a; float b; public: Test(int x=2) { a=x; b=5.8f; } void disp() { cout<<"\na="<<a<<"b="<<b<<endl; } };`
		`int main() { Test t1(10); t1.disp(); return 0; }`
		A. Compile error
		B. Runtime error
		C. a=2 b=5.8
		D. a=10 b=5.8
		E. None of these
			D	4

Q.No :1(c) i		Write the parameterized constructors for the classes B and C.
		`class A { int a; public: A(int x){a=x;} };`
		`class B:public A { int b; }; class C:public B { int c; };`
				4

ii		Explain how inheritance satisfies the reusability property in OOP.		3
iii		What is a virtual base class? When do we need to use a virtual base class?		3
iv		Consider following code and state the order of execution constructors and order of execution of destructors. class C: public B,public A { public:		4

		C( ):A( ),B( )
		{
		cout<<"c class constructor";
		}
		};		

Q.No :1(d) i		Write the code segment for overloading the following unary operator using the operator function as friend function Lets the class name is abc. abc a11; a11++;		4
ii		write the code segment for overloading the equation z=3*x, using operator overloading, z and x are objects of the same class.		4

iii		Find errors in the code given below and correct it.
		class abc
		{ int a,b;
		public:
		friend void operator >>(istream &in,abc &k1)
		{ in>>k1.a;
		in>>k1.b;
		}
		};
		int main()
		{
		abc a1,a2;
		cin>>a1>>a2;
		}
				4& 6

iv		Write down the operator overloading function prototypes of following operators with respect to a class A (i) >> (ii)<<		4

Q.No :1(e) i		Find the output for the code given below.
		#include<iostream>
		using namespace std;
		class base
		{
		public:
		virtual void display(){cout<<"In base\n";}
		};
		class derived:public base
		{
		public:
		void display(){ cout<<"In derived\n";}
		};
		int main()
		{ **derived** D;
		base *p=&D;
		p->display();
		return 0;
		}
				3

ii		Find the error in the code given below and rectify the error.
		#include<iostream>
		using namespace std;
		class **base**
		{
		public:
		virtual void display(){cout<<"In base\n";}
		};
		class **derived**:public base
		{
		public:
		void display(){ cout<<"In derived\n";}
		void show(){cout<<"Show in derived\n";}
		};
		int main()
		{ **derived** D;
		base *p=&D;
		p->show();
		return 0;
		}
				3& 6

iii		Find the output for the code given below. #include<iostream> using namespace std; class **base** int main() { **derived** D; **base** *p=&D;		3

```
{
  public:
virtual void display(){cout<<"In base\n";}
  virtual void show(){
    cout<<"Show in base\n";}

};
class derived:public base
{
     public:
  void show(){cout<<"Show in derived\n";}
};
```

```
      p->display();
      p->show();
      return 0;
}
```

iv | 3&6

Find the error in the code given below and rectify the error.

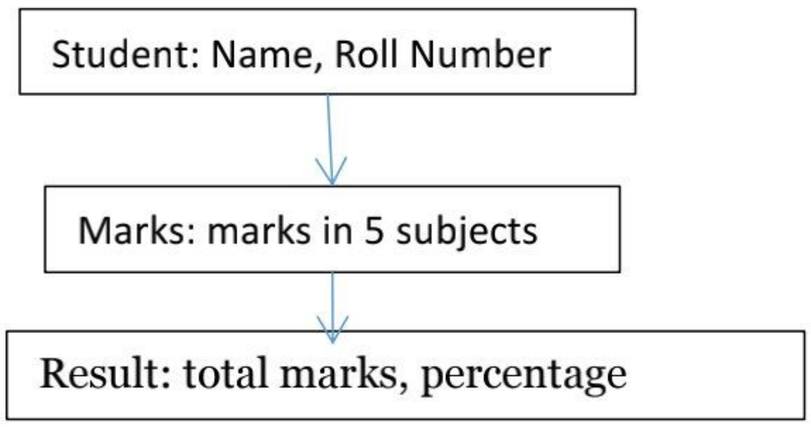
```
#include<iostream>
using namespace std;
class Base {
 public:
    virtual void display()=0;
    virtual void show(){
       cout<<"Show in Base\n";}

     };
class derived:public Base
{
     public:
     void show(){
     cout<<"Show in derived\n";}
};
```

```
int main()
{
   derived d;
  Base *p=&d;
  d->display();
   return 0;
}
```


SECTION-B(Answer Any One Question. Each Question carries 10 Marks)

Time: 30 Minutes **(1×10=10 Marks)**

Question No	Question	CO Mapping
Q.No:2	Justify whether a pure virtual function is a better choice than using a normal virtual function. [2+8] Create a class employee which stores is name , id and salary of an employee. The id should be generated upon the creation of object, starting from 1. Include all the constructors and destructor in the class. Create one object using each of the constructors and display it.	2&3
Q.No:3	What is an abstract base class? Can we create pointer of an abstract base class? [2+8] Create the classes as per the hierarchy given below.The data members are mentioned along with class name. Include parameterized constructor in all the classes.Input data for a student, calculate the total marks and percentage and display them.	2&3

		
Q.No:4	"Virtual functions are example of dynamic/late binding." Justify **[2+8]** WAP to create a class which stores numerator denominator of a rational number. Overload the following operators:- I. binary + to add two objects. II. assignment operator III. Post increment operator to add 1 to the number.	3&4
Q.No:5	When do we need a friend function for overloading any operator? Explain with example. **[2+8]** WAP to create a class which stores x and y coordinates of a point. Overload the following operators for the class I. unary - to negate the both the coordinates value. II. insertion and extraction operator . III. == , as friend function to compare two objects and return true when both the coordinates are same.	3&4
Q.No:6	"Copy constructor can have always receive the parameter by reference". State the reason. [2+8] WAP to create a class 'num' which stores an integer number. Derive three classes from 'num' class namely 'binary', 'octal' and 'hexa' which store the binary, octal and hexadecimal equivalent of the number in 'num' class. Input an integer value and display its binary, octal and hexadecimal equivalent using virtual function.	3&4

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