



FACULTY OF ENGINEERING & TECHNOLOGY

CSPS103: Object Oriented Programming

Lecture-30

Preeti Singh

Department of Computer Science & Engineering  
Rama University, Kanpur

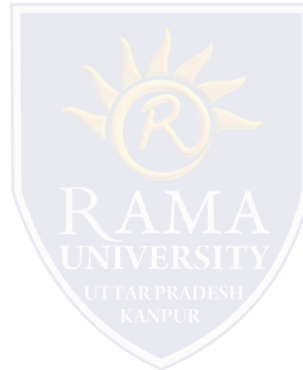
[preeti.ru@ramauniversity.ac.in](mailto:preeti.ru@ramauniversity.ac.in)

# OBJECTIVES

In this lecture, you will learn to:

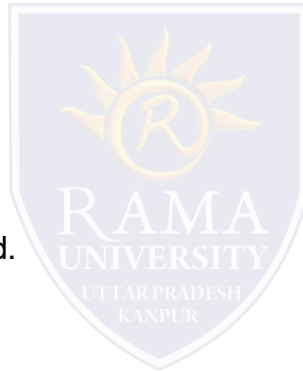
- ❖ **Abstract class**

- ❖ **Example of Abstract class**



# ABSTRACT CLASS

- ❑ When a class contains atleast one pure virtual function, it is referred to as an abstract class.
- ❑ An abstract class contains atleast one function for which no body exists, it is, technically, an incomplete type.
- ❑ No objects of that class can be created.
- ❑ Thus, abstract classes exist only to be inherited.

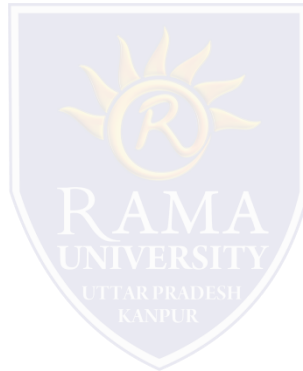


## EXAMPLE : ABSTRACT CLASS

```
#include <iostream.h>

class Shape
{
    public:
        virtual void draw()=0;
};

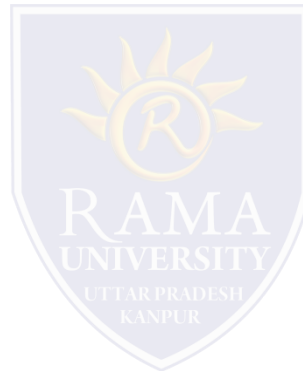
class Rectangle : Shape
{
    public:
        void draw()
        {
            cout << "drawing rectangle..." << endl;
        }
};
```



## EXAMPLE : ABSTRACT CLASS (Contd.)

```
class Circle : Shape
{
    public:
        void draw()
        {
            cout << "drawing circle..." < < endl;
        }
};

int main( ) {
    Rectangle rec;
    Circle cir;
    rec.draw();
    cir.draw();
    return 0;
}
```



# REFERENCES

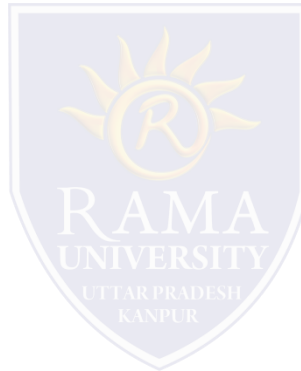
- Kernighan, Brian W., and Dennis M. Richie. The C Programming Language. Vol. 2. Englewood Cliffs: Prentice-Hall, 1988.
- King, Kim N., and Kim King. C programming: A Modern Approach. Norton, 1996.
- Bjarne Stroustrup, "C++ Programming language", 3rd edition, Pearson education Asia (1997)
- Lafore R. "Object oriented Programming in C++", 4th Ed. Techmedia, New Delhi (2002).
- Yashwant Kenetkar, "Let us C++", 1st Ed., Oxford University Press (2006)
- B.A. Forouzan and R.F. Gilberg, Compiler Science, "A structured approach using C++" Cengage Learning, New Delhi.
- <https://www.javatpoint.com/cpp-tutorial>
- <https://www.tutorialspoint.com/cplusplus/index.htm>
- <https://ambekarcollegevasai.com/wp-content/uploads/2019/03/CPP.pdf>
- [https://onlinecourses.nptel.ac.in/noc20\\_cs07/unit?unit=3&lesson=19](https://onlinecourses.nptel.ac.in/noc20_cs07/unit?unit=3&lesson=19)

# MULTIPLE CHOICE QUESTION

## Multiple Choice Question:

**Q1. Where does the abstract class is used?**

- a) base class only
- b) derived class
- c) both derived & base class
- d) virtual class



# MULTIPLE CHOICE QUESTION

## Multiple Choice Question:

**Q2. What is an abstract class in C++?**

- a) Class specifically used as a base class with atleast one virtual functions
- b) Class specifically used as a base class with atleast one pure virtual functions
- c) Class from which any class is derived
- d) Any Class in C++ is an abstract class



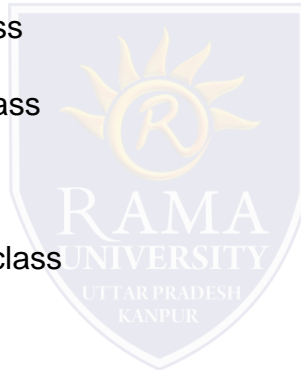


# MULTIPLE CHOICE QUESTION

## Multiple Choice Question:

**Q3. What is a pure virtual function in C++?**

- a) A virtual function defined in a base class
- b) A virtual function declared in a base class
- c) Any function in a class
- d) A function without definition in a base class

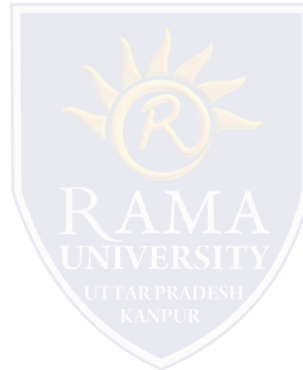


# MULTIPLE CHOICE QUESTION

## Multiple Choice Question:

**Q4. Which is the correct syntax of defining a pure virtual function?**

- a) `pure virtual return_type func();`
- b) `virtual return_type func() pure;`
- c) `virtual return_type func() = 0;`
- d) `virtual return_type func();`

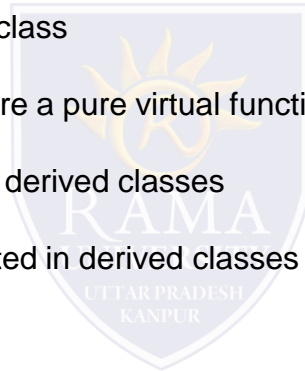


# MULTIPLE CHOICE QUESTION

## Multiple Choice Question:

**Q5. Which is the correct statement about pure virtual functions?**

- a) They should be defined inside a base class
- b) Pure keyword should be used to declare a pure virtual function
- c) Pure virtual function is implemented in derived classes
- d) Pure virtual function cannot implemented in derived classes



# Summary

## In this lecture, you learned that:

- Class is made abstract by declaring at least one of its functions as `<>strong>pure virtual function`.
- A pure virtual function is specified by placing "`= 0`" in its declaration.
- Its implementation must be provided by derived classes.

