

2021

MATHEMATICS— GENERAL**Paper : SEC-A****(Object Oriented Programming in C++)****Full Marks : 80***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words
as far as practicable.*

1. Each question below is followed by four possible answers, exactly one of which is correct. Choose the correct answer with proper justification/explanation (wherever applicable) in support of your answer. 2×10

(a) Which of the following operator can be overloaded through friend function?

- | | |
|-----------|---------|
| (i) → | (ii) = |
| (iii) () | (iv) *. |

(b) Maximum number of template arguments in a function template is

- | | |
|-------------|------------|
| (i) one | (ii) two |
| (iii) three | (iv) many. |

(c) What is the output of the following program?

```
# include <iostream.h>
Void main()
{
    float x = 5, y = 2;
    int result;
    result = x % y;
    cout result;
}
```

- | | |
|---------------------|-----------|
| (i) 1 | (ii) 1·0 |
| (iii) Error message | (iv) 2·5. |

(d) A copy constructor takes

- | | |
|--------------------|----------------------------------|
| (i) no argument | (ii) one argument |
| (iii) two argument | (iv) arbitrary no. of arguments. |

Please Turn Over

- (e) Declaration of a pointer reserves memory space
- (i) for the object (ii) for the pointer
(iii) Both for the object and the pointer (iv) None of these.
- (f) The ability of a function or operator to act in different ways on different data types is called as
- (i) Inheritance (ii) Overloading
(iii) Abstraction (iv) Encapsulation.
- (g) By default, all members in a class are _____.
- (i) public (ii) private
(iii) protected (iv) None of the above
- (h) What is the benefit of C++ input and output over C input and output?
- (i) Both Type Safety and Exception (ii) Sequence container
(iii) Exception (iv) Type safety.
- (i) A class defined within another class is
- (i) nested class (ii) inheritance
(iii) containership (iv) encapsulation
- (j) The derivation of Child class from Base class is indicated by _____ symbol.
- (i) :: (ii) :
(iii) ; (iv) 1.

Unit-I

2. Answer *any two* questions.

- (a) (i) What is object oriented programming? List out benefits of object oriented programming. 2+3
(ii) What are the differences between C and C++? Write down some application of object-oriented programming. 3+2
- (b) (i) Describe various operators used in C++.
(ii) Explain enumeration data type with an example. 5+5
- (c) (i) Write a C++ program to compute the greatest common divisor of two integers.
(ii) What is the difference between 'call by value' and 'call by reference'? 6+4

- (d) (i) Write a C++ program that uses a function to print whether the given positive number is prime or not.
- (ii) Explain the differences between class and object in object oriented programming language. 6+4

Unit-II

3. Answer *any two* questions.

- (a) What do you mean by operator overloading in C++? List the advantages of this feature. What are the limitations of operator overloading? Write a C++ program to generate Fibonacci sequence using overloading of increment operator. 2+2+1+5
- (b) What is inline function? How does it differ from normal function? Write a C++ program to calculate area and circumference of a circle using inline function. 2+2+6
- (c) (i) Explain destructor with an example. 5
- (ii) What is constructor? List out characteristics of constructors. 2+3
- (d) (i) How does polymorphism promote extensibility? Explain various types of polymorphism with example. 2+3
- (ii) What is friend function? Explain with example. 2+3

Unit-III

4. Answer *any two* questions.

- (a) (i) Explain class template. How many types of templates are there in C++? 2+3
- (ii) What is the difference between error and exception? Explain what are the different types of exceptions. 2+3
- (b) (i) What is the use of copy constructor? Explain the concept of copy constructor with the help of a suitable example.
- (ii) What is namespace in C++? Write the syntax of defining a namespace.
- (iii) Why is it important to write “using namespace std” in C++ program? (2+3)+(2+1)+2
- (c) (i) What is exception handling? Explain how to handle an exception with appropriate example. 2+3
- (ii) Write a C++ program to swap two numbers. 5
- (d) Write a C++ program to create a template to find the maximum value stored in an array. 10