

2024

COMPUTER SCIENCE

Paper : COM0300104

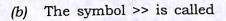
(Object-Oriented Programming in C++)

Full Marks: 45

Time: 2 hours

The figures in the margin indicate full marks for the questions

- 1. Choose the correct option from the following: $1 \times 5 = 5$
 - (a) Which feature of OOP indicates code reusability?
 - (i) Abstraction
 - (ii) Polymorphism
 - (iii) Encapsulation
 - (iv) Inheritance



- (i) lesser than
- (ii) insertion operator
- (iii) extraction operator
- (iv) None of the above



- (i) private member of the class
- (ii) protected member of the class
- (iii) public member of the class
- (iv) None of the above
- (d) When 'continue' statement is used inside a loop
 - (i) it will cause premature exit of the loop enclosing it
 - (ii) it will transfer the control to the statement following the loop
 - (iii) it causes skipping of the statements following it in the body of the loop
 - (iv) All of the above





(e) Which among the following base class members cannot be inherited in C++?

- (i) Member data
- (ii) Member function
- (iii) Friend relationship
- (iv) Virtual function

Answer any five of the following questions:

 $2 \times 5 = 10$

- (a) Mention a few benefits of object-oriented programming paradigm.
- (b) Mention the difference between a structure and a class.
- (c) What is inline function?
- (d) Write down the statements only, to print the elements of an $n \times n$ matrix of integers row-wise.
- (e) What is an operator?
- (f) List out logical operators in C++.

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(Turn Over)

(g) Find out errors, if any, in the following and rewrite correctly:



- (h) What do you understand by multiple inheritance?
- (i) What is the need of a function?
- (j) List the operators, which cannot be overloaded.
- 3. Answer any four of the following questions:

- (a) Explain the benefits of the objectoriented approach.
- (b) Explain the general structure of a C++ program.

- (c) Define a class cuboid having three data members length, breadth and height. Write a default constructor to set these values to zero. Write a member function to compute its volume and another to check if it is a cube, i.e., all three dimensions are equal.
- (d) Define a class to represent points in the two-dimensional space using their coordinate values which are real numbers. Overload the unary operator "-" such that if p is the point (x, y), then -p is the point (-x, -y).
- (e) Define a class. Write the general syntax of defining a class.
- (f) What is a friend function? Why do we use it?
- (g) What is a parameterized constructor? Exemplify.
- (h) In inheritance relationship, what is the order of construction and destruction?

- 4. Answer any one of the following questions: 10
 - Differentiate between the following terms with suitable examples: $2 \times 5 = 10$
 - (i) Abstraction and Encapsulation
 - (ii) Function overloading and Function overriding
 - (iii) Virtual function and Pure virtual function
 - (iv) New operator and Delete operator
 - (v) Multiple inheritance and Multilevel inheritance
 - Nagaon Wagaon (b) What is operator overloading? Why do we need it? Write the general form of operator overloading function. Mention the difference between overloading a unary operator and a binary operator.

2+1+3+4=10

(c) What is an exception? Explain the exception handling mechanism. Explain how a single-catch block can handle all exceptions. 2+6+2=10

- Write a C++ program to define a class "complex" with two data members "real" and "img" to represent real and imaginary part of a complex number. Write member functions:
 - (i) rpart(): to return the real part of a complex number
 - (ii) ipart(): to return the imaginary part of a complex number
 - (iii) add(): to add two complex numbers
 - (iv) mul(): to multiply two complex numbers

Write constructors with zero, one and two arguments to initialize the object.

 $1+(1\frac{1}{2}\times4)+3=10$

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