

**Instructions:-**

- (i) The marks are indicated in the right-hand margin.
- (ii) There are **NINE** questions in this paper.
- (iii) Attempt **FIVE** questions in all.
- (iv) Question No. 1 is compulsory.

**Q.1 Choose the correct answer of the following (Any seven question only):** **[2 x 7 = 14]**

- (a) Which among the following best describes the inheritance?
  - (i) copying the code already written
  - (ii) using the code already written once.
  - (iii) using already defined functions in programming language
  - (iv) using the data and functions into derived segment.
- (b) Which of the following is not a type of class?
  - (i) Abstract class
  - (ii) Final class
  - (iii) Start class
  - (iv) String class
- (c) What is the default access specifier for data members or member functions declared within a class without any specifier in C++?
  - (i) Private
  - (ii) Protected
  - (iii) Public
  - (iv) Depends on compiler
- (d) Which of the following is not the member of class?
  - (i) Static function
  - (ii) Friend function
  - (iii) Constant function
  - (iv) Virtual function
- (e) Which constructor will be called from the object created in the code below?  
 Class A  

```

{
    int i;
    A ( )
    {
        i= 0;
    }
    A (int x = 0)
    {
        i=x;
    }
};
A obj1;
```

  - (i) Default constructor
  - (ii) Parameterized constructor
  - (iii) Compile time error
  - (iv) Run-time error
- (f) To prevent any method from overriding, we declare the method as
  - (i) Static
  - (ii) const
  - (iii) final
  - (iv) None of the above
- (g) In C++ dynamic memory allocation is accomplished with the operator:
  - (i) new
  - (ii) this
  - (iii) malloc
  - (iv) delete
- (h) When a class serves as base class for many derived classes, the situation is called
  - (i) polymorphism
  - (ii) hierarchical inheritance
  - (iii) hybrid inheritance
  - (iv) multipath inheritance

- (i) For a method to be an interface between the outside world and a class, it must be declared
- (i) private (ii) protected
- (iii) public (iv) external
- (j) Which of the following statement is correct?
- (i) Base class pointer cannot point to derived class
- (ii) Derived class pointer cannot point to base class.
- (iii) Pointer to derived class cannot be created
- (iv) Pointer to base class cannot be created.
- Q.2** (a) What are the advantages of using exception handling mechanism in a program? [7]  
Explain the uses of try, throw and catch keywords using example.
- (b) Write a C++ program to find the sum of the series  $1+3+5+\dots+n$ . [7]
- Q.3** (a) What is inheritance? Discuss different types of inheritance with examples. [7]
- (b) What is operator overloading? Write a program in C++ to overload unary minus operator. [7]
- Q.4** (a) What is pure virtual function? Write a C++ program that prints 'BEU Patna' from inside a member function of a subclass overriding a pure virtual function. [7]
- (b) Discuss why converting a base-class pointer to a derived-class pointer is considered dangerous by compiler. [7]
- Q.5** (a) Differentiate between abstract class and interface with suitable examples. [7]
- (b) What is access modifier in C++? Differentiate between each type. [7]
- Q.6** (a) Differentiate between a class and an object. Write an example (syntax) to define a class in C++. [7]
- (b) With an example, explain the terms *constructor* and *destructor*. [7]
- Q.7** (a) What is a friend function and what are its advantages? What are the guidelines that should be followed while using friend function? [7]
- (b) Explain dangling pointer with the help of an example. [7]
- Q.8** (a) Explain how base class member functions can be involved in a derived class if the derived class also has a member function with the same name. [7]
- (b) Create a class *complex* and implement the following: [7]
- (i) Define suitable constructors and destructors
- (ii) Overload the operators + and -
- (iii) Write a friend function *sum* which adds the real and imaginary parts of a complex object.
- Q.9** Write short notes on any two of the following: [7 x 2=14]
- (a) Polymorphism
- (b) Function Templates
- (c) Container class
- (d) Inline function

