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B.E. (Computer Science Engineering) Fifth Semester (C.B.S.)

Object Oriented Programming

P. Pages : 3 **NJR/KS/18/4489**

Time : Three Hours * 0 0 4 1 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.
8. Assume suitable data whenever necessary.
9. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Differentiate between procedural and object oriented programming. Also explain the applications and advantages of OOP. **7**

b) Suppose a car racing game is to be designed in which the player can view how many other cars are in the race at any point in time. Illustrate the use of static data member for this purpose, by writing a program. **6**

OR

2. a) What is a copy constructor ? If C++ compiler provides default copy constructor, why do we explicitly write copy constructor, for a class. Illustrate the different ways of invoking a copy constructor, with the help of an example. **7**

b) Define a class student with data members Roll No. name and percentage. Using this class, create 10 students and display information of student who secured highest percentage. **6**

3. a) Define a class to represent a complex number having real part and imaginary part as data members. Write a program to add 3 complex numbers using operator overloading. (Overload the '+' operator). **8**

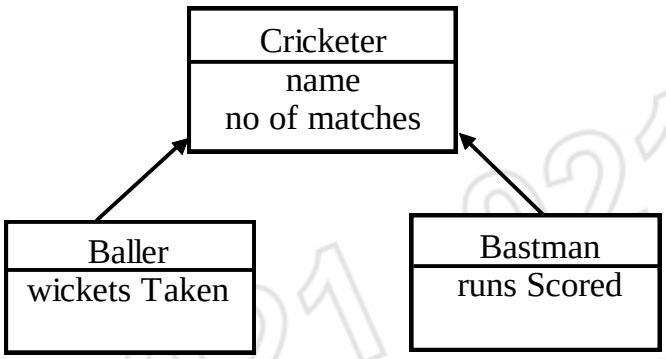
b) Demonstrate the use of conversion operator for conversion between objects of different classes. **6**

OR

4. a) Illustrate the use of following with an example of each. **8**
i) New and delete operator. **3+3+2**
ii) Address-of operator (&)

b) Define a class string. Use operator overloading to overload = = operator for comparison of two strings. **6**

5. a) Consider the following class hierarchy. **8**



Write a program to implement above class hierarchy using appropriate feature of OOP. Define all the derived class constructors and functions to get and print data of a Baller and Batsman.

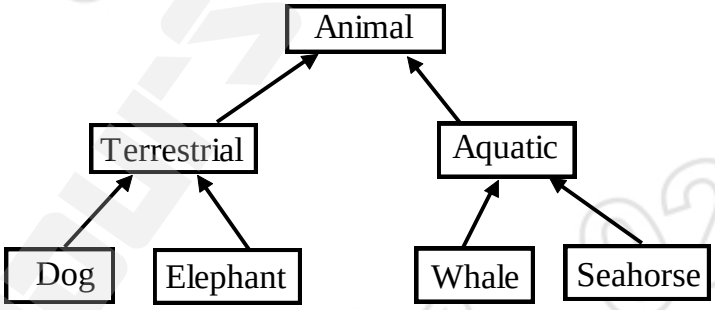
b) What is private inheritance? Illustrate a situation where private inheritance can be used. **6**

OR

6. a) Consider a case of multiple inheritance, in which multiple base classes contain functions with same name while a class derived from these classes have no function with this name. How do objects of derived class access the correct base class function? Can this ambiguity be resolved? Justify with an example. **7**

b) Differentiate between inheritance and containership. Should containership be preferred over inheritance? Justify your answer. **7**

7. a) Identify the abstract class (es) and concrete class (es) in the following class hierarchy. What is the purpose of declaring a class as 'abstract'. Explain with the following example. **7**



b) Explain the uses of 'This' pointer with suitable example. **6**

OR

8. a) If a class hierarchy uses function overriding, how does the compiler resolve a call to overridden function? Explain the concept of late binding. **7**

b) Is it possible for a non-member function of a class to access private data of that class? Support your answer with an example. **6**

9. a) What is a stream? What are its advantages. Explain the stream class hierarchy in c++. **7**

b) What is the use of manipulators? Explain the various manipulators. Supported by C++ I/O streams. **6**

OR

10. a) Explain the difference between formatted and unformatted I/O with a suitable example. **6**

b) Write a program that creates an output file student info dat. Write students information to that file and read back that information. **7**

11. a) Define a function sort( ) using function template, which accepts an array of type int, char and float and sorts the array in ascending order. **8**

b) What is the need of multiple try blocks for a single catch block? Explain with example. **5**

OR

12. a) What are containers in standard template library? Explain the different types of containers in brief. **6**

b) Define a class triangle with its three sides as data members, a constructor to initialize its data members and a function get Area () which finds area of a triangle. Using this class, create a triangle and calculate its area. If a user enters a negative value for any of the sides of triangle, an exception should be thrown and appropriately handled. (Use exception handling mechanism of C++). **7**

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Itâ€™s hard to beat a person who never gives up.

~ Babe Ruth