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CA 601: Object Oriented Programming Through Java

Practical Questions

Q.1 Write a program to assign any 5 numbers into array and print them in descending order.

Q.2 The abstract **Fruit** class has four sub classes named **Apple, Orange, Mango, Grapes**. Write an application that demonstrates how to establish this class hierarchy. Declare one instance variable of type String that indicates the color of **Fruit**. Create and display instances of these objects. Override the **toString()** method of object to return a string with the name of the fruit & its color.

Q.3 Write a program to create package with following conditions

a. Same package same class

b. Same package sub class

c. Same package with non-sub class

d. Other package with sub class

e. Other package with non-sub class

Q.4 Write a program to create interface and implement interface. Make necessary assumptions.

Q.5 Write a program that illustrate the use of runtime polymorphism

Q.6 Code a java program for the Oil and Refinery Company which receives transporting of raw materials. Consider there is one abstract class named **RowMaterial** having some instance variables like Goods-value(in Rs.) Service tax and Surcharge. There are two other sub classes like **ByRoad** and **ByShip.** There are two classes named **Railway** and **Transport** which follow the **ByRoad** class. Both these class have **calculate()** and **display()** methods. There is one class named **Ship** which follow **ByShip** and it also has **calculate()** and **display()** methods. There is a main class named **OilRef** where all these methods are called according to user choice. Now you have to calculate service tax and

surcharges according to Goods value. For this apply following conditions.

1. By Road:
   - There is 12% service tax and 3% surcharge (on service tax) on goods value for both railway and transport.
2. By Ship:
   - If transporting is out of country than service tax is 20% on goods value and 2% surcharge (on service tax).
   - If transporting is within country than service tax is 10% on goods value and 2% surcharge (on service tax).
3. If user enter goods value less than 1 than generate custom exception for it.

Q.7 Code a java program in such a way that cover all the transition of library for issuing and submitting books for student as well as staff. For that follow the description.

1. There is one abstract class named **Lib** that contains three subjects in library like Java 100 books, SQL 150 books and CG 50 books. There are also two methods **submit()** and **issue()**.
2. There are two interfaces named **Student** and **Staff** contains one method **info().** (Note: Both the interfaces has same name method info()).
3. There is one class named **LibTransitions** that calculate (for issue and submit) extends and implements appropriate classes and interfaces.
4. There is main class named **Library** that calls all methods according to user selection for Staff of Student.
5. Whenever transaction occurs stock must be updated for books.

Q.8 Write a program to create one main thread that display simple 1 to 10 numbers and create another thread that display square of 1 to 10 numbers in java.

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Q.9 Write a program that shows access protection in inheritance within same package.

Q.10 Write a program that explains access scope of variables into and out of package.

Q.11 Define an interface **Calculation** with method void **calculateArea()** that must be implemented in **Circle**, **Rectangle**, and **Triangle** classes to calculate area of each shape respectively.

Q.12 Write a program that demonstrates nested interfaces.

Q.13 Create an abstract class **Ships** that has three subclasses namely **Titanic**, **Starcruise** and **Victoria**. Create two interfaces namely **Passenger** and **Warship**. Both of which contains a method **display()** which displays the message like "Titanic is a passenger ship". **Passenger** interface is implemented by **Titanic** and **Starcruise**. **Victoria** implements **Warship**. Define all these classes and implement interfaces as specified. Create one instance of each class and then display all the passenger ships and warships. Place this code in a package named **AllShips**.

Q.14 Define an interface **AddSubtract** with two methods **void Addition(int,int)** and **void Subtraction(int,int)** and another interface **MultiplyDivide** with two methods **void Multiply(int,int)** and **void Divide(int,int)**. Extend first interface into second and implement the interfaces into suitable classes.

Q.15 Create an interface **Interface1** containing two methods **float computeArea(float, float)**, **float computePerimeter(float,float)**. Create two different classes **Rect** and **Circle** and implement above two methods in these classes. In main, create the instances of **Rect & Circle** using new operator, assign them into an object of type **Interface1** and display areas and perimeters respectively.

Q.16 Write a program that uses **Try** and **Catch** block for exception handling.

Q.17 Write a program to demonstrate the use of **throw** and **throws** keywords.

Q.18 Write a program to demonstrate the use of **Nested Try** statements.

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Q.19 Write a program to demonstrate the use of multiple **Catch** statements.

Q.20 Create your own exception that will arise when length of a string is less than 10.

Q.21 Write a program that explains the use of **ArrayIndexOutOfBoundsException**.

Q.22 Write a program explaining the use of **NoClassFoundException**.

Q.23 Create an exception **NotSame** which will be thrown when two compared strings are not same. Implement this exception in a suitable program.

Q.24 Create an exception **PrimeNumber**, which will be thrown if the number is found to be prime. Implement it with your program.

Q.25 Write a program that will allow a user to enter two numbers through command line argument and calculate their division. Handle all the exceptions (Like user can provide 0,1 or 2 arguments or user can give 0 as a second number then **/ by zero exception** should be occurred.)

Q.26 Define a method **void division(int,int)** which throws **ArithmeticException** which must be caught into main().

Best of Luck