**104. Principle of Object-Oriented Programming.**

1. Learning OOP is different than learning java.

2. OOP’s concept are important.

3. Concept’s:

a. Abstraction:

b. Encapsulation:

c. Inheritance:

d. Polymorphism:

4. **Abstraction:**

a. Hiding internal details and showing required features.

b. See only required things.

5. **Encapsulation:**

a. Binding everything inside a single container.

6. **Inheritance:**

a. Inheriting the properties/features from previous things into current one

b. Same as **specialization.**

7. **Polymorphism:**

a. It is same **generalization**.

8. **Specialization**: Adding newer feature in current thing and making new thing out of it is called specialization.

9. **Generalization**: Grouping similar things under one name.

10. Think them in terms of real-world life things.

**105. Class vs Object**

1. Anything in the world is called an object.

2. Anything in world can defined in terms of properties and behaviour.

3. **Object:** Object is defined in terms of its properties and behaviour.

4. Behaviour will affect, utilise the properties.

5. Simple method to identify the properties and methods of object:

a. Write everything about it.

b. Nouns and adjectives are properties.

c. Verbs are behaviours.

6. Class is a blueprint. Object is an instance of the class.

7. Class is logical and Object is real.

8. We can create as many object as we want from class.

9.

a. Objects are created in the heap.

b. Variables (reference variable) occupy memory of stack.

c. Methods will be in method area.

10.

**106. How to write the classes.**

1. Circle:

a. Properties:

radius.

b. Methods:

area.

perimeter.

2. Rectangle:

a. Properties:

length.

breadth.

b. Methods:

area.

perimeter.

3. Cylinder:

a. Properties:

radius.

height.

b. Methods:

area.

volume.

4. Student:

properties:

roll number.

name.

course.

marks.

methods:

total marks.

result.

grades.

percentage.

5. account:

properties:

account number:

methods:

**107. Writing a Class for Circle.**

1. We should define methods and properties.

2. We should define datatypes of circle.

3. We should define parameters required by methods and return type of method.

4. There is a built-in constant give in java inside class Math which is pi.

Math.PI

5. Every class java will create a separate file.

**108. Student Challenge: Write a Class for Rectangle.**

**109. Student Challenge: Write a Class for Cylinder**

**110. Student Challenge: Write a Class for Student.**

1. To print the class directly with reference it should have toString() method.

For example

Student s = new Student();

System.out.println(s);

**111: Data Hiding.**

1. Data hiding makes the using object simple.

2. It prevents the user from hindering with inside mechanism.

3. To hide we use access modifiers:

a. **private**: We cannot access outside the class.

b. **public:** We can access anywhere.

c. **protected:** We can access it inside the class and inside the child classes.

4. The getter and setter method is used get and set the variables. They helps to prevent from getting data mishandled. They can also do job of setting the data.

**112. Practicing Data Hiding.**

1. It is good to keep sensitive class variables private.

**113. Type of Properties.**

1. Type of Properties:

a. Read and Writable

b. Read Only.

c. Write Only.

2. class Student

a. Read and Writable: Marks. (most properties.)

b. Read Only: Name of the student.

c. Write Only: depositing money in account. ( Required in between two threads, class (Most rare situation))

**114. Constructor**

1. **Constructor:** It is a method of class which is called automatically upon creation of object.

2. Every class in java have default constructor.

3. Constructor doesn’t have any return type.

4. Usually, we make constructors public.

5. Constructors have same name as class.

6. There are two types of constructor:

a. Default constructor.

b. Parameterized constructor.

7. Constructor is used to initialize values.

**115. Practicing Constructors.**

1. Methods starting with word “is” are called as enquiry methods.

2. Methods of class called as instance methods or facilitators.

**116. Student Challenge: Cylinder.**

**117. Student Challenge: Product and Customer.**

Product:

1. itemno
2. price
3. qty
4. name
5. set methods to modify.
6. constructor is for setting the values.

Customer

a. customer no

b. name

c. address

d. phone

1. Decide appropriate datatype.

**118. Array of Objects Challenge.**

1. **“this”:** It is a key word used as a reference to current object.