**Pattern problems:**

**1)**

1 2 3 4 5

6 7 8 9

10 11 12

13 14

15

**2)**

3

6 9

12 15 18

21 24 27 30

**Java is Object Oriented Programming System – (OOPS)**

**Structure:**

* **Class -  A class is**a user defined blueprint or prototype from which objects are created**.**
* **Object – Instances of class**
* **Method – it is member of a class which contains set of java statements. It has a return types, access modifier and can have attributes**
* **Attributes – Parameters passed inside a method are called attributes**

**Principals of OOP**

* **Inheritance**
* **Abstraction**
* **Polymorphism**
* **Encapsulation**

**Inheritance : Acquiring properties from parent**

**Extends keyword is used to get properties from parent to child.**

**Parent class – Vehicle - KTM:**

**petrolEngine**

**desielEngine**

**EV**

**gears**

**braking**

**Child RC extends Vehicle - KTM -**

**Type**

**Colour**

**Style**

**Child Duke**

**Type**

**Colour**

**Style**

**Types of Inheritance:**

1. **Single inheritance – only one parent and one child**
2. **Multilevel inheritance –**
3. **Hierarchical inheritance - one parent class is inherited by more than one child class**
4. **Multiple Inheritance – not possible in java ( Interface helps us to achieve this)**
5. **Hybrid Inheritance - not possible in java (Hierarchical + Multiple) ( is not possible because it leads to diamond problem)**