UNTI – 1

**INTRODUCTION TO OOP AND JAVA FUNDAMENTALS**

Question Bank

**PART – A**

**2 – Marks**

1. **Define OOP**

It is a software design methodology. It is a software programming model that constructed based on objects. It aims to implement real world entities in programming.

Languages supports opps concepts: C++, Java, Python .. etc

1. **What are the four principles?**

* Abstraction
* Encapsulation
* Inheritance
* Polymorphism

These are the 4 principles of oops

1. **What is Abstraction?**

Abstraction is one of the four important concepts of oop principles. It is used to manage the complexity of the program. It helps us to hiding unwanted information like internal working mechanism of an object from the users. It helps to maintain the integrity of the system.

1. **What is encapsulation?**

It is a concept of containment of code [methods] and data together. Encapsulation ensures the protections against illegal access of data from the outside of the world. It protects from other class methods docent’s affects data directly.

1. **Write a java program to compute BMI of a person.**

import java.io.\*;

class Main {

public static void main(String[] args){

double h, w, bmi;

h = 1.58;

w = 87;

bmi = w / (h \* h);

System.out.println("H:"+h+"W:"+w+"BMI:"+bmi);

}

}

***Output:***

H:1.58 W:87.0 BMI:34.85018426534209

1. **What is Constructor?**

* Constructor is special type of method member in class.
* It is method that used to initialize objects.
* It resembles the class name
* It doesn't have any return type.
* It cannot be called.
* It is automatically called at the time of object creation.

1. **Define Parameterized Constructor.**

* It is constrictor with arguments.
* It receives the argument from user at the time of object creation.
* It initializes those values for data members instead of user defined defaults.

1. **Give a short note on static members of a class.**

Static members are data members (variables) or methods that belong to a static or a non static class itself, rather than to objects of the class. ... Because static members are associated with the class, it is not necessary to create an instance of that class to invoke them.

Eg: static int a = 10 let this present inside class called Main then accessing this variable can be Main.a

1. **List the access specifiers in java with its access rights.**

Access specifiers help us to provide restrictions among the variables or methods we use.

There are four types of access specifiers available in java.

* private – it provides access only with in the class. Outside access prohibited.
* default – it provides full access with in the packages.
* protected – it provides full access outside the package but only through inheritance.
* public – it provides universal access. It has maximum scope when compare to others.

1. **Write program to store and print odd numbers from 1 to 100 using arrays.**

import java.io.\*;

class Main {

public static void main(String[] args){

int[] odds = new int[50];

int j = 0;

for(int i = 1;i<=100;i++){

if(i%2 != 0){

odds[j] = i;

j++;

}

}

for(int ele:odds)

System.out.print(ele+"\t");

}

}

***Output***

1 3 5 7 9 11 13 15 17

19 21 23 25 27 29 31 33 35

37 39 41 43 45 47 49 51 53

55 57 59 61 63 65 67 69 71

73 75 77 79 81 83 85 87 89

91 93 95 97 99

1. **Write a java program to compute simple interest for a bank.**

import java.io.\*;

class Main {

public static void main(String[] args){

double p = 100;

double in\_per = 3;

int years = 5;

//A = P(1 + rt)

double pay\_able = p \* (1 + (in\_per/100)\*years);

System.out.println("P:"+p+" I:"+in\_per+"

Y:"+years+"PAYABLE:"+pay\_able);

}

}

***Output***

P:100.0 I:3.0 Y:5 PAYABLE:114.99999999999999

1. **Give a short note on constants in a class.**

* Constants are the variable that has initialized values and it cannot be changed during the execution of the program.
* In java the variables that is declared as final [final int x = 10] is known as final variable or constants.
* Constant are used with static scope for a reasons eg [Math.PI] PI is final static variable available in Math class that represents the PI value.

1. **How do we comment in java source files?**

* Comments are used by the developer or documenter that helps to understand the codes.
* It is ignored by the time of compilation
* There are two types of comments
  + Single line comment [Done by commenting line with double forward slashes // ]
  + Multiline comment
    - It helps to comment a block of line
    - Block is surrounded with [/\*….\*/] statements.

1. **List the operators supported by java.**

* Unary Operator,
* Arithmetic Operator,
* Shift Operator,
* Relational Operator,
* Bitwise Operator,
* Logical Operator,
* Ternary Operator and.
* Assignment Operator.

1. **Define package and its usage.**

Package in Java is a mechanism to encapsulate a group of classes, sub packages and interfaces. Packages are used for:

* Preventing naming conflicts. For example there can be two classes with name Employee in two packages, college.staff.cse.Employee and college.staff.ee.Employee
* Making searching/locating and usage of classes, interfaces, enumerations and annotations easier
* Providing controlled access: protected and default have package level access control. A protected member is accessible by classes in the same package and its subclasses. A default member (without any access specifier) is accessible by classes in the same package only.
* Packages can be considered as data encapsulation (or data-hiding).

**PART – B**

**13 – Marks**

1. Explain about principles of OOPS.
2. Explain about characteristics of java.
3. Explain about data types supported by java with simple example.
4. Explain about constructors in java with example.
5. Explain about control structures available in java with some example.
6. Write a program that gets the student details from the user
   1. Name, Roll-no, Marks obtained from 3 subjects as input.
   2. Compute the total and average with precision.
   3. Display their grade based on average [O, A, B, C, D, F].
7. Write a program for unit conversion based on following requirement
   1. Converters need for [Miles to Kilometre, Celsius to Fahrenheit, Hours to Seconds ] and vice versa.
   2. Place them in a package in com.exam.converters and import and use as third party packages.
   3. Both parameterized and non default constructor needed for failsafe.
8. Write an java program that handles the array as follows
   1. Get the array limit from the user and create exactly the same size integer array.
   2. Start to receive data from user and store in array.
      1. If user enters odd number just store it otherwise add 10 with user input and store.
   3. Perform sum of array elements and find the sum is prime or not.