Beehyv Freshers Training - Test 1

1. There are 2 sections, Section A contains 3 questions and Section B contains 15 questions.
2. For Section A, the code has to be written in preferred IDE and then submitted as per information provided at the time of the test. For Section B, the answers have to written in the sheet itself.
3. Maximum time allowed is **2 hours 30 minutes**.
4. Internet strictly **not** allowed.
5. Exception handling, code efficiency and coding standards contains weightage.

Section A:

1. Write a program to reverse an integer.(without converting into string) **(3 marks)**

2. Write a program to convert a string containing only lower case english alphabets into a palindrome with minimum number of insertions.You can shuffle the letters of given string if required. **(5 marks)**

3. Write a program to take input from a text file .Find the unique characters in the input file and write them into a file with name “output.txt” .(Input file is in java home folder with name input.txt) **(6 marks)**

Section B:

Code Snippet 1:

```
class A {
	public void sayHello(){
		System.out.println(“A says hello”);
	}
}

class B extends A{
	public void sayHello(){
		System.out.println(“B says hello”);
	}
}

class C{
	private static int apples = 0;
	private int mangoes = 0;

	private String name;

	public C(String n){
		name = n;
	}

	Public C(){
	}

	public void addApples(int newApples){
		apples += newApples;
	}

	public void addMangoes(int newMangoes){
		mangoes += newMangoes;
	}

	public void printApples(){
		System.out.println(name + “ has “ + apples + “ apples.”);
	}

	public void printMangoes(){
		System.out.println(name + “ has “ + mangoes + “ mangoes.”);
	}
}
```

For the following questions, assume that the following variables are declared (wherever necessary):

```
A a = new A();
B b = new B();
```

1) What is the output of the following:

```
a.sayHello();
b.sayHello();
a = b;
a.sayHello();
```

A says hello
B says hello
B says hello

2) Which of the following statements compile without any errors (indicate why a particular statement, if any, will not compile)?

a) `a = b;` This will compile

b) `b = a;` This wont compile because A is the superclass

3) Which of the following statements fail at runtime (indicate why a particular statement, if any, will fail at runtime)?

a) `a = b;` This wont fail at runtime

b) `b = (B)a;` This also wont faill as it is typecasted

4) Which of the following statements are invalid and why?

a) `b = new A();` invalid

b) `a = new B();` valid

5) What is the output of the following code (assume that initial value of apples and mangoes is 0)?

```
C c1 = new C("c1");
C c2 = new C("c2");

c1.addApples(5);
c2.addApples(10);
c1.addMangoes(15);
c2.addMangoes(20);

c1.printApples();
c2.printApples();
c1.printMangoes();
c2.printMangoes();
```

c1 has 15 apples
c2 has 15 apples
c1 has 15 mangoes
c2 has 20 mangoes

6) Given an array of integers, write a java function that returns the number of occurrences of the n^{th} smallest number.

Hint: Your function should look somewhat like this:

```
int findOccurences(int[] input, int n){
      int occurrences = 0;

      // TODO: put the logic for computing the occurrences value here

      return occurrences;
}
```

7) What is the difference between an interface and a class in Java?

Classes can contain variables and methods, or functions that specify how a given data type behaves.
An interface is like a template which defines a group of related methods with empty bodies.

8) What is wrong with the following code?

```
public class SomethingWrong{
	private String name;

	public SomethingWrong(String n){
		name = n;
	}

	public void saySomething(){
		System.out.println(this.name + " is saying something");
	}

	public static void saySomethingLouder(){
		System.out.println(this.name + " is saying something louder");
	}
}
```

Remove static method from here because it wont be able to access the instance as satic is there

9) What is the difference between `java.lang.Exception` and `java.lang.RuntimeException` classes?

10) Write a function that generates the n^{th} Fibonacci number ***efficiently***.
Note: Fibonacci series is defined as
F(n) = F(n-1) + F(n-2) for n > 1
F(1) = 1
F(0) = 0

Hint: You function should look somewhat like this:

```
int fib(int n){
	// TODO: compute the nth Fibonacci number and return its value
}
```

11) What is the wrong with the following code?

```
class Animal{
	private String name;
	public Animal(String name){
		this.name = name;
	}
}

class Dog extends Animal{
	public Dog(){
	}

	public void bark(){
		System.out.println("Bow Bow");
	}
}
```

Here in dog class ,constructor dog should include super keyword to name ,super (name) to resolve issue

12) What is wrong with the following code?

```
class X{
	public X(){
	}

	public static void doSomeWork(){
		toString();
	}
	public void saySomething(){
		toString();
		doSomeWork();
	}

	public String toString(){
		return “X”;
	}
}
```

we directly cant call tostring method in static method ,
correct way is calling an instance of X and then calling tostring

Here also tostring is called incorrectly ,here we will have to use this keyword

13) What is the output of the following code?

```
public static void main(String[] args){
	// see the Code Snippet at the beginning for definitions of class C
	C c = new C();
	c.addMangoes(5);
	processMangoes(c);
	c.printMangoes();
}

public static void processMangoes(C c1){
	c1 = new C();

	c1.addMangoes(15);
	c1.printMangoes();
}
```

c has 15 mangoes
c has 5 mangoes

14) Write a function that computes the factorial of a given number “n”.
Hint: You function should look somewhat like this:

```
int factorial(int n){
	// TODO: compute the factorial of n and return the computed value
}
```

15) What is the output of the following Java code:

```
class PassS {
	public static void main(String [] args) {
		PassS p = new PassS();
		p.start();
	}
	void start() {
		String s1 = "slip";
		String s2 = fix(s1);
		System.out.println(s1 + " " + s2);
	}
	String fix(String s1) {
		s1 = s1 + "stream";
		System.out.print(s1 + " ");
		return "stream";
	}
}
```

slipstream slip stream