**Title: Core Java Assessment Time: 2.30hrs**

**Set 2: Marks: 100**

**Section 1: MCQ - 10 questions-20 marks**

**Section 2: Java Coding- 6 programs -80 marks**

**Emp No: Emp Name:**

**Instructions:**

* Please write your name and employee Id in the answer sheet
* Answer the **MC**Q questions in the given answer sheet
* Please read the questions carefully and write the Java code in eclipse.
* In section 2, Question no 1,2,and 3 are carries 10 marks each and 4,5 are carries 15 marks each and question no 6 carries 20 marks.
* Use proper naming conventions for class name, package name, method name and variables name.
* Create a java project named SysArcJava\_yourname and create a package for each questions.
* We do not entertain any malpractice during assessment. Involved such activities will not be allowed to continue the assessment.

**Section 1: MCQ**

1) **What will be the output?**

**class Test{**

public static void main(String ar[]){

Set<Data> s=new TreeSet<Data>();

s.add(new Data(4));

s.add(new Data(2));

s.add(new Data(4));

s.add(new Data(1));

s.add(new Data(2));

System.out.print(s.size());}}

1. 5

b) 3

c) 4

d) None of the above

**2)What will be the output of the program?**

class MyThread extends Thread

{

MyThread() {}

MyThread(Runnable r) {super(r); }

public void run()

{

System.out.print("Inside Thread ");

}

}

class MyRunnable implements Runnable

{

public void run()

{

System.out.print(" Inside Runnable");

}

}

class Test

{

public static void main(String[] args)

{

new MyThread().start();

new MyThread(new MyRunnable()).start();

}

1. Throws exception at runtime
2. Prints "Inside Thread Inside Thread"
3. Compile time error

**3) Consider the following code and choose the correct option:**

public class Test {

public static void main(String[] args) {

String data="7882";

data+=32;

System.out.println(data); }}

1. 7882
2. 788232
3. 7912

**4) Consider the following code and choose the correct option:**

class Cthread extends Thread{

Cthread(){start();}

public void run(){

System.out.print("Hi");}

public static void main (String args[]){

Cthread th1=new Cthread();

Cthread th2=new Cthread();

}}

1. will create two child threads and display Hi twice
2. will not create any thread
3. will create three thread and display Hi only once

**5) Consider the following code and choose the correct option:**

package aj; class S{ int roll =23;

private S(){} }

package aj; class T

{ public static void main(String ar[]){

System.out.print(new S().roll);}}

1. compilation error
2. run time exception
3. prints 23

6) **Consider the following code and choose the correct output:**

class Test{

public static void main(String args[]){

TreeMap<Integer, String>hm=new TreeMap<Integer, String>();

hm.put(2,"Two");

hm.put(4,"Four");

hm.put(1,"One");

hm.put(6,"Six");

hm.put(7,"Seven");

SortedMap<Integer, String>sm=hm.subMap(2,7);

SortedMap<Integer,String> sm2=sm.tailMap(4);

System.out.print(sm2);

}}

1. {4=Four,1=one,6=Six}
2. {4=Four, 6=Six}
3. None of the above

**7) Given:**

public static Collection get() {

Collection sorted = new LinkedList();

sorted.add("B"); sorted.add("C"); sorted.add("A");

return sorted;

}

public static void main(String[] args) {

for (Object obj: get()) {

System.out.print(obj + ", ");

}

}

**What is the result?**

a) Compilation fails.

b) B, C, A,

c) A, B, C

d)Runtime Exception

8) **Consider the following code and choose the correct output:**

class Test{

public static void main(String args[]){

int a=5;

if(a=3){

System.out.print("Three");

}

else

{

System.out.print("Five");

}

}

}

a) Three Five

b)compilation error

c)None of the above

d)Five

9) **Consider the following code and choose the correct option:**

abstract class Car{

abstract void accelerate();

}

class Lamborghini extends Car{

@Override

void accelerate() {

System.out.println("90 mph"); }

void nitroBooster(){

System.out.print("150 mph"); }

public static void main(String[] args) {

Car mycar=new Lamborghini();

Lamborghini lambo=(Lamborghini) mycar;

lambo.nitroBooster();}}

a) compilation error

b) 90 mph

c) 150 mph

d) null

**10)What will be the output of following code?**

import java.util.\*;

class I

{

public static void main (String[] args)

{

Object i = new ArrayList().iterator();

System.out.print((i instanceof List)+",");

System.out.print((i instanceof Iterator)+",");

System.out.print(i instanceof ListIterator);

}

}

1. Prints: false, true, false
2. Prints: true, false, true
3. Prints: null

**Section 2: Java Coding**

**1)Odd Digit Sum**

Write a program to input a String array. The input may contain digits and alphabets (“de5g4G7R”). Extract odd digits from each string and find the sum and print the output.

For example, if the string is "AKj375A" then take 3+7+5=15 and not as 375 as digit.

Include a class **UserMainCode** with a static method **oddDigitSum** which accepts a string array and the size of the array. The return type (Integer) should return the sum.

Create a Class Main which would be used to accept Input Strings and call the static method present in UserMainCode.

Assume maximum length of array is 20.

**Input and Output Format:**

Input consists of an integer n, corresponds to the number of strings, followed by n Strings.

Output consists of an Integer.

Refer sample output for formatting specifications.

**Sample Input :**

3

sys2arc1

al33k

d2t4H3r5

**Sample Output :**

15

**(1+3+3+3+5)**

**2) Forming New Word from a String**

Write a program to read a string and a positive integer n as input and construct a string with first n and last n characters in the given string.

Include a class **UserMainCode** with a static method **formNewWord** which accepts a string and positive integer .

The return type of the output should be a string (value) of first n character and last n character.

Create a class **Main** which would get the input as a string and integer n and call the static method **formNewWord** present in the UserMainCode.

**Input and Output Format:**

Input consists of a string of even length.

Output is a string .

Note: The given string length must be >=2n.

Refer sample output for formatting specifications.

**Sample Input 1:**

California

3

**Sample Output 1:**

Calnia  
**Sample Input2:**

this

1

**Sample Output 2:**

**ts**

**3)Largest Element**

Write a program to read an int array of odd length, compare the first, middle and the last elements in the array and return the largest. If there is only one element in the array return the same element.

Include a class **UserMainCode** with a static method **checkLargestAmongCorner** which accepts an int arrayThe return type (integer) should return the largest element among the first, middle and the last elements.

Create a Class Main which would be used to accept Input array and call the static method present in UserMainCode.

Assume maximum length of array is 20.

**Input and Output Format:**

Input consists of n+1 integers. The first integer corresponds to n, the number of elements in the array. The next 'n' integers correspond to the elements in the array.

Output consists of a single Integer.

Refer sample output for formatting specifications.

**Sample Input 1:**

5

2

3

8

4

5

**Sample Output 1:**

8

**4)Reverse SubString**

Given a string, startIndex and length, write a program to extract the substring from right to left. Assume the last character has index 0.

Include a class **UserMainCode** with a static method “**reverseSubstring**” that accepts 3 arguments and returns a string. The 1st argument corresponds to the string, the second argument corresponds to the startIndex and the third argument corresponds to the length.

Create a class **Main** which would get a String and 2 integers as input and call the static method **reverseSubstring** present in the UserMainCode.

**Input and Output Format:**

The first line of the input consists of a string.

The second line of the input consists of an integer that corresponds to the startIndex.

The third line of the input consists of an integer that corresponds to the length of the substring.

**Sample Input:**

rajasthan

2

3

**Sample Output:**

hts

**5)Mastering Hashmap**

You have recently learnt about hashmaps and in order to master it, you try and use it in all of your programs.

Your trainer / teacher has given you the following exercise:

1.   Read 2n numbers as input where the first number represents a key and second one as value. Both the numbers are of type integers.

2.   Write a function **getAverageOfOdd**to find out average of all values whose keys are represented by odd numbers. Assume the average is an int and never a decimal number. Return the average as output. Include this function in class UserMainCode.

Create a Class Main which would be used to read 2n numbers and build the hashmap. Call the static method present in UserMainCode.

**Input and Output Format:**

Input consists of a 2n+ 1 integers. The first integer specifies the value of n (essentially the hashmap size). The next pair of n numbers denote the key and value.

Output consists of an integer representing the average.

Refer sample output for formatting specifications.

**Sample Input 1:**

4

2

34

1

4

5

12

4

22

**Sample Output 1:**

8

**6)Middle of Array**

Write a program to read an integer array and return the middle element in the array. The size of the array would always be odd.

Include a class UserMainCode with a static method **getMiddleElement** which accepts a single integer array. The return type (integer) should be the middle element in the array.

Create a Class Main which would be used to accept Input array and call the static method present in UserMainCode.

**Input and Output Format:**

Input consists of n+1 integers. The first integer corresponds to n, the number of elements in the array. The next 'n' integers correspond to the elements in the array.

Output consists of a single Integer value.

Refer sample output for formatting specifications.

Assume that the maximum number of elements in the array is 19.

**Sample Input 1:**

5

1

5

23

64

9

**Sample Output 1:**

23