**Ex. No. 2:** **DATA TYPES AND CONTROL STRUCTURES**

**(30/1/2017-3/2/2017)**

**Note: Part I and Part 2 should be recorded in your observation as directed by your mentor**

**Part-I (Who should do Part-I?)**

***Anyone who wants to clear java, hope everyone wants to…….***

1. Write a Java program to find the roots of quadratic equation. [eg: ax^2+bx+c, read integer values for a, b, c from user. Calculate int d= b^2-4ac. Use type casting for finding the roots.
2. Write a menu driven Java program with following option   
   a. Accept elements of an array   
   b. Display elements of an array   
   c. Search the element within array given by user  
   d. Sort the array using bubble sort method   
   Write methods for all options. The methods should be static and have one parameter name of the array.
3. Write simple programs to demonstrate ***enhanced for*** (for each) statement, ***labeled break*** and ***labeled continue*** statements.

**Part-II: MCQ (Who should do Part-II?)**

***Who will not love fun? If you love fun go ahead …and you can take this fun back home and continue there as well……………….***

1. What is the output for the following program?

class conversion {

public static void main (String args[])

{

double a =295.04;

int b =300;

byte c =(byte) a;

byte d =(byte) b;

System.out.println(c +" "+ d);

}

}

a) 38 43

b) 39 44

c) 295 300

d) 295.04 300

2. What will be the output of the program?

class Equals

{

public static void main(String [] args)

{

int x = 100;

double y = 100.1;

boolean b = (x = y); /\* Line 7 \*/

System.out.println(b);

}

}

a) true

b) false

c) Compilation fails

d) An exception is thrown at runtime

3. Which four options describe the correct default values for array elements of the types indicated?

1. int -> 0

2. String -> "null"

3. double->0.0d

4. char -> '\u0000'

5. float -> 0.0f

6. boolean -> true

a) 1, 2, 3, 4

b) 1, 3, 4, 5

c) 2, 4, 5, 6

d) 3, 4, 5, 6

4. Which will legally declare, construct, and initialize an array?

a) int [] myList = {"1", "2", "3"};

b) int [] myList = (5, 8, 2);

c) int myList [] [] = {4,9,7,0};

d) int myList [] = {4, 3, 7};

5. What will this code print?

int arr[] = new int [5];

System.out.print(arr);

a) 0

b) 00000

c) garbage value

d) 11111

6. What is the output for the following program?

class selection\_statements {

public static void main(String args[])

{

int var1 =5;

int var2 =6;

if((var2 =1)== var1)

System.out.print(var2);

else

System.out.print(++var2);

}

}

a) 1

b) 2

c) 3

d) 4

7. What is the output of the following program?

class jump\_statments {

public static void main(String args[])

{

int x =2;

int y =0;

for(; y <10;++y){

if(y % x ==0)

continue;

else if(y ==8)

break;

else

System.out.print(y +" ");

}

}

}

a) 1 3 5 7

b) 2 4 6 8

c) 1 3 5 7 9

d) 1 2 3 4 5 6 7 8 9

**Part-III (Who should do Part-III?)**

***If you are a person who loves to challenge yourself, train yourself till you tire and in short for those who aspire to become extra intellect, this is for you***

1. **Question:** A manufacturing company has classified its executives into four levels for the benefit of certain perks. The levels and corresponding perks are shown below.

|  |  |  |
| --- | --- | --- |
| **Level** | **Perks** | |
| **Conveyance Allowance** | **Entertainment Allowance** |
| Manager | 1000 | 500 |
| Project Leader | 750 | 200 |
| Software Engineer | 500 | 100 |
| Consultant | 250 | - |

Write a program that will read an executives job number, level number and basic pay and then compute the net salary.

**Procedure:**

1. Design a simple class called as “Employee” with the following variables

Level as String

Job\_number as integer

Gross, Basic, House\_rent, Perks, Net, Incometax as double

Initialize the allowance as

CA1=1000,CA2=750,CA3=500,CA4=250,EA1=500,EA2=200,EA3=100,EA4=0

2. Get job number, Level and Basic pay from user (hint: use scanner class to get input from user)

3. Calculate the perks for different levels (hint: use switch case to select between levels)

4. Calculate gross, House\_rent, Incometax and Net as per Specification given.

5. Display Level, Job\_number, Gross pay, Tax and Net salary.

**Specification:**

HRA at 25% of basic pay

Perks = CA1+EA1 (for Manager) etc.,

Gross salary = basic pay+ HRA + Perks

Net salary = Gross Salary – Income Tax

To calculate Income Tax use the following information

|  |  |
| --- | --- |
| **Gross salary** | **Tax Rate** |
| Gross <=2000 | No Tax |
| 2000 < Gross <=4000 | 3% |
| 4000 < Gross <= 5000 | 5% |
| Gross> 5000 | 8% |

1. Write a program that generates a random number and asks the user to guess what the number is. If the user's guess is higher than the random number, the program should display "Too high, try again." If the user's guess is lower than the random number, the program should display "Too low, try again." The program should use a loop that repeats until the user correctly guesses the random number.
2. Write a Java program to simulate simple calculator with +-\*/ operators using if…else if.
3. Write a program to calculate the sum of following series where n is input by user.   
   1 + 1/2 + 1/3 + 1/4 + 1/5 +…………1/n
4. Write a Java program to find the transpose of a matrix.
5. Write a Java program to find the result of the following expression:
6. (a<<2) + (b>>2)
7. (a+b\*c%d-(a\*d))/10
8. Z=++x\*y—