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ITCS106,113 (Computer Programming I)

Final Exam Revision

سيتم شرح حل هذه الأسئلة مع شرح موجز لكل جبتر في المراجعة الشاملة المتوفرة بموقعنا الالكتروني

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Question 1: Choose the correct answer from the given choices.

(1) What is the output of the following program segment:

(a) 01
(b) 03
(c) 13
(d) 12

```
for (int i=0; i<=2; ++i)
      if (i==1)
         continue;
      else
         System.out.print(++i);
```

(2) What is the output of the below code segment?

(a) 9
(b) 6
(c) 20
(d) 0

```
int i =0, j = 0;
for (i=2; i<=3; i++)
   j += i;
System.out.println(i*j);
```

(3) Which of the following loops will execute the body of the loop at least once.

(a) do - while loop
(b) while loop
(c) for loop
(d) All are correct

(4) What is the output of the below code segment?

(a) done
(b) 1 2 done
(c) 1 2 3 done
(d) 1 2 3 2 3 done

```
for (int i=0; i<3; i++)
{
   switch (i)
   {
      case 0 : break;
      case 1 : System.out.print(1 + " ");
      case 2 : System.out.print(2+ " ");
      case 3 : System.out.print(3 +" ");
   }
}
 System.out.println("done");
```

(5) What is the output for the following java code?

(a) NALE
(b) NAL
(c) ALE
(d) ALEX

```
String n=”FINALEXAM”;
System.out.println(n.substring(3,6));
```

(6) What is the output for the following java code?

(a) 6
(b) 4
(c) 10
(d) 15

```
public static int findMe (int a){
    int b=2;
    a*=b;
    return a;
}
public static void main(String[] args) {
   int r=0;
   r+=findMe(3);
   r+=findMe(2);
    System.out.println(r);
}
```

(7) What is the output for the following java code?

```
for (int x=1; x<=2; ++x)
{
   for (int y=1; y<=x; y++)
      System.out.print("*");
System.out.println("#");
}
```

(a) *#
    **#

(b) **#
    **#

(c) **#
    *#

(d) *#*#*#
    ##*#

(8) Which among the following is called first, automatically, whenever an object is created.

(a) New
(b) Constructor
(c) Class
(d) None of these

(9) What is the return type of a method that does not return any value?

(a) int
(b) boolean
(c) void
(d) double

(10) Given the statement below:

int [] A = {3,6,9};

A.length can't be used to display the number of elements in the array.

(a) True
(b) False

(11) suppose vaccine is a private String. Which of the following is its accessor (get) method?

(a)
```
public String getVaccine(String v)
{
   vaccine = v;
}
```

(b)
```
public String getVaccine() {
   System.out.println(vaccine);
}
```

(c)
```
public String getVaccine(String v)
{
    return v;
}
```

(d)
```
public String getVaccine()
{
   return vaccine;
}
```

(12) To create 2D array of size 3 rows and 5 columns the following statement can be used:

```
int [][] table;
table = new int [3][5];
```

(a) True
(b) False

(13) What is the output for the following java code?

```
int[] list = {4,2,5,3};
int total=0;
for (int x=1; x<3; ++x)
   total+=list[x];
System.out.println(total);
```

(a) 14
(b) 7
(c) 10
(d) 9

(14) For a two-dimensional array list, the value of **list.length** indicates:

(a) The number of rows
(b) The number of columns
(c) It depends on Array size
(d) Not valid for 2D array

(15) What is the output for the following java code?

(a) 0, 3, 3
(b) 0, 3, 4
(c) 1, 2, 3
(d) 1, 2, 4

```
public static void chgMe (int [][] z, int p){
   ++z[1][0];
   --z[0][1];
   ++p;
}

public static void main(String[] args) {
   int [][] x= {{2,1},{2,3}};
   chgMe(x,x[1][1]);
   System.out.println(x[0][1] + ", " + x[1][0]
+ ", " + x[1][1]);
}
```

(16) The statements below will:

int [ ] [ ] itcs113 = new int [10][6];

(a) Creates 2 arrays each array of size 10 rows and 6 columns
(b) Creates table as 2D array of size 10 rows and 6 columns
(c) Creates table as 2D array of size 6 rows and 10 columns
(d) Compile error

Question 2 :What is the output of the following codes?

(A)

```
int a=4;
int b=6;
a++;
--b;

if (b % 2 !=0)
{
   ++a;
   System.out.println (a+b);
}
else
   System.out.println (a-b);

System.out.println ((a++) + "\t" + (--b));
```

Output

(B)

```
int [ ] number = {10,20,19,20};
char [ ] letter = {'A', 'B', 'C', 'D'};
for (int i=0; i<=2; i++)
{
if(number[i] %2 == 0 && number[i+1]%2==1)
letter[i] = 'X';
else
number[i]=i;
}
for (int i=0; i<4; i++)
System.out.println(number[i]+"-"+letter[i]);
```

Output

(C) What is the output of the following code:

```
char [][] arr ={ {'A','H','B'}, {'T','K','N'}, {'D','I','G'} };
    for (int k=1; k<=2; k++)
        for(int g=1;g<=2;g++)
            System.out.print(arr[g][k]);
```

Output

(D)

```
public class Animal {
    private String name;
    private boolean hasLegs;
    private double weight;

    public Animal (String name, boolean hasLegs, double
weight){
        this.name = name;
        this.hasLegs = hasLegs;
        this.weight = weight;
    }

    public String getName () {return this.name; }

public boolean HasLegs () { return this.hasLegs;}
    public double getWeight () {return this.weight;}
}

public class TestAnimal {

    public static void main(String[] args) {

        Animal n1 = new Animal("Tiger", true, 300.0);

        System.out.println("Name " + n1.getName());
        System.out.println("Weight: " + n1.getWeight());
        System.out.println ("Has Legs? " + n1.HasLegs());
        if (n1.getWeight()<2.0 && n1.HasLegs()== false)
      System.out.println ("Lives in desert");
        else
        System.out.println ("Lives in Jungle");
    }

}
```

Output

Question (2) : A restaurant would like to monitor its daily profits for a week. For each day, the management would like to know whether the revenue has increased compared to the previous day. Write a java program to do the following:

1. Prompt the user to enter the revenues for one week and store them into an array.
2. Print the average revenue.
3. Print a report showing the day, followed by the revenue amount, followed by the word "Increased" if the revenue has increased, and finally followed by the incremented amount. See for a sample output below

SAMPLE INPUT/OUTPUT

```
Enter the revenues for one week:
120.500 150.50 65.50 78.250 46.250 125.900 95.780
The average revenue is 97.52571428571427

Weekly Report
Day     Revenue   Status      Amount
1       120.5
2       150.5     increased   30.0
3       65.5
4       78.25     increased   12.75
5       46.25
6       125.9     increased   79.65
7       95.78
```

Question (3) Write a Java program to do the following:

1- Create an array list of type integer of size (n).
2- Ask the user to fill an array.
3- Write a Java program to separate even and odd numbers of a given array of integers. Put all even numbers first, then 0's if any, and then odd numbers.

Sample Input/output

```
Enter the array size (n): 10
please fill the array: 0 1 2 3 4 5 6 7 8 9

The array after rearranging: 2 4 6 8 0 1 3
5 7 9
```

Question (4)

Part (A) Write a method called **average** that accepts two parameters, a 1D array marks, and the second parameter is the number of students. The method calculate and return the average of the marks.

Part (B): Complete the main program to prompt the user to enter number of students, then create an array named marks and save them in the array marks.

Sample Input/output
Please Enter the numeber of students (n): 4 Please Enter students mark: 9.5 1.5 3.5 10 The Average is = 6.125

Question (5)

Used cars showrooms are places where used cars are displayed and sold. Write a method **generateReport()** that takes as a parameter a two-dimensional array named prices of size 7 x 5 that contains used car prices in which each row represents a day and each column represents a showroom. The method displays the average used car price for each showroom. In addition, it should display the showroom with the highest average car price.

For example, if the main method for this program has prices array values as given below:

```
public static void main(String[] args) {
     double [][] prices = {{3.0,1.0,1.0,7.0,5.0},
                           {1.5,1.0,3.0,1.0,4.7},
                           {2.5,2.2,1.0,1.9,1.7},
                           {1.0,1.0,8.0,2.2,4.1},
                           {4.5,9.0,8.0,4.2,2.7},
                           {1.5,1.0,4.0,4.2,2.3},
                           {6.5,4.5,9.7,2.9,3.7}};

          generateReport(prices);
     }
```

Your **generateReport()** method should display the following output:

```
Showroom 0 average used car price is 2.9285714285714284
Showroom 1 average used car price is 2.814285714285714
Showroom 2 average used car price is 4.957142857142857
Showroom 3 average used car price is 3.3428571428571425
Showroom 4 average used car price is 3.457142857142857

Showroom 2 has the highest average of 4.957142857142857
```

Question (6) - part1: Define a class with the following specification:

a. The class name is **FuelTank** with three private data members:
   - **capacity** (double) : represents the tank capacity measured in liter.
   - **content** (double) : represents the amount of fuel in tank measured in liter.
   - **lowLevel** (Boolean) : represents fuel level if its low or not using Boolean (true or false)

b. Define a private method called **updateLowLevel()** that does the following steps:
   Step 1: compute the fuel percentage as follows:

   Fuel Percentage = (content / capacity)x 100

   Step 2: update the private **lowLevel** variable to true if the fuel percentage is less than 10%,
   otherwise, **lowLevel** should be false.

c. Define a constructor that accepts thank's **capacity** and **content** as input parameters to initialize the **capacity** and **content** private data members and call the method defined in part (b) to update **lowLevel**.

d. Define a public method called updateFuelContent() that accepts fuelAmount (double) as input parameter (it might be either positive or negative). The method does the following steps:
   Step 1: Add the **fuelAmount()** to content data member.
   Step 2: In case the new value of content exceeds **capacity**, set **content** to **capacity**.
   Step 3: In case the new value of content becomes negative, set **content** to 0.
   Step 3: update the **lowLevel** variable by calling the method defined in (b).

e. Provide an accessor (**get**) method for **lowLevel** data member and a mutator (**set**) method for **capacity** data member.

f. Define a public method called **show()** that displays the fuel tank information as shown in the sample:

```
Tank Capacity: 140.0 litres
Tank Content: 120.0 litres
```

Part(2) : Write a Java application to do the following:

a. Create an object called **ftank** from the class **FuelTank** and initialize its private members with capacity 140 and content 40.
b. Ask the user to input the fuel amount to add or remove from the tank's content. Update the fuel content for ftank object by calling the method **updateFuelContent()** and passing the fuel amount as input parameter.
c. Call the method **show( )** for the created object.
d. Display a message "Fuel level is low" or "Fuel level is enough" according to the returned value from the method **getLowLevel().**