



BZU-HUB

صُمِّمَ هَذَا الْمَوْقِعَ لِيُخْدَمَ طُلُوبَةَ جَامِعَةِ بَيْرِزِيَتِ، وَهُوَ
مَوْقِعٌ غَيْرٌ رِبْحِي

[10%]

C. Write a driver class called `ProgrammerMain` that creates an `ArrayList` of programmers. Add 2 `SeniorProgrammers` and 2 `Programmers`. Write a method called `totalSalaries()` that takes an `ArrayList` of programmers as a parameter and calculates the sum of all programmers salaries. Then call this method from main and print the result.

```
public class PogrammerDriver {

    public static void main(String[] args) {

        ArrayList<Programmer> list =new ArrayList<>();

        list.add(new Programmer("Ahmad",140,10));
        list.add(new SeniorProgrammer("Ali",155,10,500));
        list.add(new Programmer("Zaid",140,10));
        list.add(new SeniorProgrammer("Sami",150,8,700));

        double total=totalSalary(list);
        System.out.println("Total Salaries= "+total);

    }

    public static double totalSalary(ArrayList<Programmer> list) {
        double total=0.0;
        for(int i=0;i<list.size();i++) {
            total+=(list.get(i)).getSalary();

        }

        return total;
    }

}
```

%)
Write a SeniorProgrammer class (میرمج خیر). They have a bonus amount which is added as
t of their salary. Override the toString() method to print programmer names with their salary and
us.

```
class SeniorProgrammer extends Programmer{
    protected double bonus;

    public SeniorProgrammer(String name, double hours, double rate, double bonus)
    {
        super(name, hours, rate);
        this.bonus = bonus;
    }

    public double getBonus() {
        return bonus; }

    public void setBonus(double bonus) {
        this.bonus = bonus; }

    public double getSalary() {
        return getBonus()+super.getSalary();
    }

    @Override
    public String toString() {
        return "Senior Programmer name " +super.getName()+", Salary: "
getSalary() ;
    }
}
```

Question#1 [30 Marks] Choice the best Answer:

[1]. Which of the following statements correctly create an array of five empty Strings?

1. `String[] a=new String[5];
for(int j=0;j<5;j++)
a[j]="";`
2. `String[] a={"", "", "", "", ""};`
3. `String a[5];`
4. `String [5] a;`
5. `String [] a=new String[5];
a[]={ "", "", "", "", ""};`

A. None B. Only 1 C. Only 1 and 2 D. Only 1, 2 and 5

[2]. What is the value of n ?

```
String str="Comp231 midterm exam";  
int n= str.indexOf("231",str.length()-1);
```

A. 0 B. -1 C. 4 D. Compiler error

[3]. Given the following code, what is the output ?

```
StringBuilder sb = new StringBuilder("Hi");  
System.out.println(sb.length());
```

A. 0 B. 2 C. 16 D. Compiler error

[4]. Suppose `List<String> list = new ArrayList<>()`; Which of the following operations are correct?

- A. `list.add(new Integer(100));`
- B. `list.add(new ArrayList());`
- C. `list.add("Red");`
- D. `list.add(new java.util.Date());`

[5]. To find a maximum object in an array of strings (e.g., `String[] names = {"red", "green", "blue"};`), use

- A. `Arrays.max(names);`
- B. `Collections.max(Arrays.asList(names));`
- C. `Arrays.sort(names);`
- D. `Collections.max(names);`

[6]. This characteristic of object-oriented programming allows the correct version of an overridden method to be called when an instance of a subclass is used to call it.

A. Inheritance B. Aggregation C. Association D. Polymorphism

[7]. The default equals method implementation of class Object determines:

- A. whether two references refer to the same object in memory.
- B. whether two references have the same type.
- C. whether two objects have the same instance variables.
- D. whether two objects have the same instance variable values.

7. Which of the following statements is correct to create a DataOutputStream to write to a file named out.dat?

- A. DataOutputStream outfile = new DataOutputStream(new File("out.dat"));
- B. DataOutputStream outfile = new DataOutputStream(new FileOutputStream("out.dat"))
- C. DataOutputStream outfile = new DataOutputStream(FileOutputStream("out.dat"));
- D. DataOutputStream outfile = new DataOutputStream("out.dat");

8. Which class do you use to write data into a text file?

- A. File
- B. PrintWriter
- C. Scanner
- D. System

9. To read a data that are at known positions in a large file, we use class of type

- A. RandomAccessFile
- B. FileInputStream
- C. File
- D. Scanner

10. To create a list to store integers, use

- A. ArrayList<Object> list = new ArrayList<Integer>();
- B. ArrayList< Integer > list = new ArrayList<Integer>();
- C. ArrayList<int> list = new ArrayList<int>();
- D. ArrayList<Number> list = new ArrayList<Integer>();

11. The method header is left blank in the following code. Fill in the header.

```
1. public class Test {
2.     public static void main(String[] args ) {
3.         Integer[] integers = {1, 2, 3, 4, 5};
4.         String[] strings = {"London", "Paris", "New York", "Austin"};
5.         print(integers);
6.         print(strings);
7.     }
8.     _____ {
9.         for (int i = 0; i < list.length; i++)
10.            System.out.print(list[i] + " ");
11.            System.out.println(); }
12. }
```

- A. public static void print(Integer[] list)
- B. public static void print(String[] list)
- C. public static void print(Object[] list)
- D. public static <E> void print(E[] list)

12. Which of the following declarations use raw type?

- A. ArrayList<Object> list = new ArrayList<Object>();
- B. ArrayList<String> list = new ArrayList<String>();
- C. ArrayList< Integer > list = new ArrayList< Integer >();
- D. ArrayList list = new ArrayList();

Question#2 [16 Marks]: Read each statement below carefully. Place a T on the line if you think a statement is TRUE. Place an F on the line if you think the statement is FALSE.

T	1	Creating an array of objects references (an array of String object for example) does not create the actual objects whose references will be stored in the array.
T	2	Arrays themselves are objects, so an array variable is a reference to the actual array, therefor, two different array variables can be used refer to the same array memory.
F	3	Each object that belongs to a class has its own copy of static variables, and the values of these copies can change independently(مستقل) of the values of other copies.
T	4	A constructor is a special method with the same name as the class that is used to initialize the members of a class object. Constructors are called when objects of their classes are instantiated.
F	5	An instance method cannot refer to a static member (method or variable).
T	6	A method declared static cannot access non-static members and cannot invoke non-static method directly. A static method cannot use the this reference because static class variables and static methods exist independent of any object of a class.
T	7	Overloaded methods can have different return values, and must have different parameters lists. Two methods differing only by return type will result in a compilation error.
F	8	Constructors must declare a return type (either void or some other type).

[8]. Which of the following keywords allows a subclass to access a superclass method even when the subclass has overridden the superclass method?

- A. base.
- B. this.
- C. public.
- D. super.

[9]. Using the protected keyword includes giving a member:

- A. public access.
- B. package access.
- C. private access.
- D. block scope.

[10]. What is the output ?

```
class A {
    A() {
        System.out.print(" Welcome");
    }
    A(String str) {
        System.out.print(str);
    }
}

public class subClass {

    public static void main(String[] args) {
        new C(" Hello");
        new B();
    }
}
```

```
class B extends A {
    B() {}
    B(String str) {
        super(str);
    }
}

class C extends B {
    C() {
        super(" Hi");
    }
    C(String str) {
        super(str);
    }
}
```

- A. Hello Hi
- B. Hello Welcome
- C. Hello Hello
- D. Hello Welcome Hi

Fill Answers in the following sheet (**USING CAPITAL LETTERS ONLY**):

الرجاء تعبئة جدول الاجابة بحروف اللغة الانجليزية الكبيرة فقط. لن يتم التصحيح لمن يخالف التعليمات

Questions	1	2	3	4	5	6	7	8	9	10
Answers	C	B	B	C	B	D	A	D	B	B

Question#3 [20 Marks]

Write only one method that accepts the length of password as a parameter and generate a random password which includes characters from the following list(0-9,A-H,w-z, and \$@!#%&), The signature of method is:

```
//Using Random Class
```

```
public static String passwordRandomGenerator (int len) {  
    String chars = "0123456789ABCDEFGHwxyz!@#$%&";  
    Random rnd = new Random();  
    StringBuilder sb = new StringBuilder(len);  
    for (int i = 0; i < len; i++)  
        sb.append(chars.charAt(rnd.nextInt(chars.length())));  
    return sb.toString();  
}
```

```
//Or using Math.random() method
```

```
public static String passwordRandomGenerator (int len) {  
    String chars = "0123456789ABCDEFGHwxyz!@#$%&";  
    StringBuilder sb = new StringBuilder(len);  
    for (int i = 0; i < len; i++)  
        sb.append(chars.charAt((int) (Math.random() * chars.length())));  
    return sb.toString();  
}
```


Question 3: Write Java code

1. Given an array list declared as:

```
ArrayList<Integer> numList = new ArrayList<Integer> ();
```

A. Write a Java code segment to display the maximum element of the array list.

```
public static <E extends Comparable<E>> E maximum(ArrayList<E> list) throws Exception {  
    E max = list.get(0);  
    for(E element : list) {  
        if(element.compareTo(max)>0)  
            max = element;  
    }  
    return max;  
}
```

B. Write a Java code segment to replace odd numbers elements of the array list with zeroes.

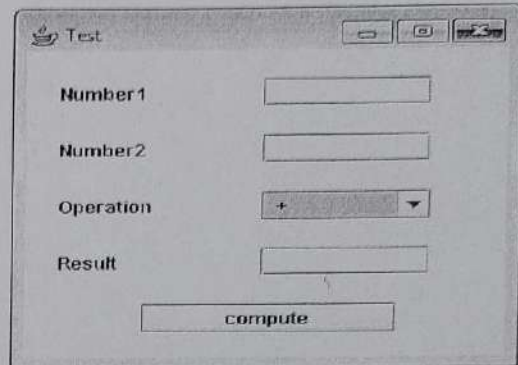
```
public static void replaceOddNumbers(ArrayList<Integer> list) {  
    for(int i=0;i<list.size();i++) {  
        if(list.get(i)%2 != 0)  
            list.set(i, 0);  
    }  
}
```

Question 4: Write Java code

(12 points)

1. Given a frame doing simple calculations on two numbers as shown in the below figure. The frame enables the user to enter two numbers, select an operation(+,-,*) from a combo box and then apply the operation on the numbers by clicking a compute button.

A. Write a Java code segment to define the GUI components as shown in the frame.



B. Write a Java code for function that perform the compute button action.

[15%]

A. Write a Programmer class. The Programmers work number of hours per month. They should have an hourly rate (₹) and number of hours per month, if they worked more than 140 hours per month then their total monthly salary will be raised up by 5%. You have to Override the toString() method to print programmer name with his/her salary. Override the equals method to return true if two programmers have the same salary.

```
class Programmer{
    protected String name;
    protected double hours;
    protected double rate;

    public Programmer(String name, double hours, double rate) {
        this.name = name;
        this.hours=hours;
        this.rate=rate; }

    public String getName() {return name;}

    public void setName(String name) {this.name = name;}

    public double getHours() {return hours;}

    public void setHours(double hours) { this.hours = hours; }

    public double getRate() {return rate;}

    public void setRate(double rate) { this.rate = rate; }

    public double getSalary() {
        if(getHours()>140)
            return getRate()*getHours()*1.05;
        return getRate()*getHours();
    }
    @Override
    public String toString() {
        return "Programmer name=" + name + ", " + getSalary() ; }

    @Override
    public boolean equals(Object obj) {
        if(obj instanceof SeniorProgrammer)

            return (this.getSalary()==((SeniorProgrammer) obj).getSalary());
        else if (obj instanceof Programmer)
            return (this.getSalary()==((Programmer) obj).getSalary());

        return false; }
}
```

COMPUTER SCIENCE III: ITCS 2304
FINAL EXAMINATION
TIME: 2 HOURS

TOTAL POINTS (50)
PAGES (6)

DATE: 20/1/2013

QUESTIONS (4)

Ahmed elghazali

الرقم الجامعي:

الإسم (رباعي):

Question 1: Choose the correct answer

(25 points)

1. Given:

```
1. public class Test {  
2.     static String s = "";  
3.     public static void doStuff(){s += "4"; }  
4.     public static void main(String[] args) {  
5.         try {  
6.             s += "1";  
7.             System.out.println(1/0);  
8.             } catch (Exception e){  
9.                 s += "2";  
10.            } finally {  
11.                s += "3"; doStuff();}  
12.            System.out.println(s);  
13.        } }
```

What is the result?

- A. 12
B. 13
C. 123
D. 1234

2. _____ checks whether the JCheckBox jchk is selected.

- A. jchk.getSelected()
B. jchk.selected()
C. jchk.isSelected()
D. jchk.select()

3. The method _____ adds an item s into a JComboBox jcbo.

- A. jcbo.add(s)
B. jcbo.addChoice(s)
C. jcbo.addItem(s)
D. jcbo.addObject(s)

★ _____ method that executes immediately after the init() method in an applet is _____.

- A. run()
B. start()
C. stop()
D. paint()

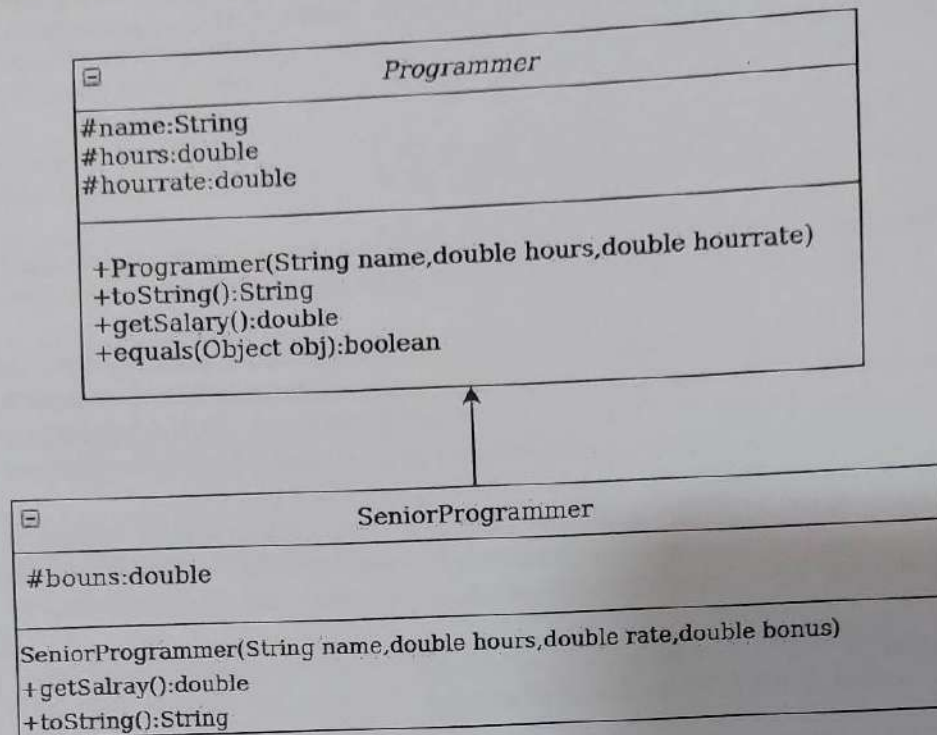
★ The default layout of the contentPane of a JApplet is _____.

- A. FlowLayout
B. GridLayout
C. BorderLayout
D. None

6. Which of the following methods can be used to know what the user selects from the combo Box?

- A. getSelectedItem()
B. getSelectedChoice()
C. getSelectedIndex()
D. getSelectedObject()

Question#4 [40 Marks]: Given the following UML diagram



NOTE:

Assume that ALL setters and getters are given, no need to implement any of them
There is no grade for implementation of them.

20. Given:

1. `PreparedStatement Stmt =`
2. `con.prepareStatement("UPDATE EMPLOYEE SET SALARY = ? WHERE EMP_NAME LIKE ?");`
3. `//insert your code here`
4. `????`
5. `????`
6. `Stmt.updateRow();`

Which code could be placed at `????` to to update the salary for the employee whose name is "Rami" to be 5000 ?

- A. `Stmt.setString(0, "Rami"); Stmt.setDouble(1, 5000);`
- B. `Stmt.setDouble(0, 5000); Stmt.setString(1, "Rami");`
- C. `Stmt.setDouble(1, 5000); Stmt.setString(2, "Rami");`
- D. `Stmt.UpdateDouble(0, 5000); Stmt.UpdateString(1, "Rami");`


Table of Answers:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.

Question 2: Write Java code

(5 points)

1 Given:



```
1. class App {
2.     public static void main(String [] args) {
3.         System.out.println("WELCOME TO MY WEBSITE");
4.         System.out.println( );
5.         System.out.println("    Currently Under Construction    ");
6.     }
```

Convert the above Java program to an applet with the text output in the applet window.