American University of Beirut
Math200- Introduction to Programming
Final – Fall 2001-2002
Time :1 Hour & 30 min.

Name : _____
Id : _____
Section : _____

A. Multiple choice. Choose the correct answer (36 pts)

Please place your answers here clearly:

1. The following code will print _____.

```
int i = 10 + 20 - 20/20 * 40 % 5;
System.out.println(i++);
```

   a) 10
   b) 30
   c) 20
   d) 11
   e) None of the above

Question	Answer
1	
2	
3	
4	
5	
6	
7	
8	
9	

2. Given the following sequence of Java statements

```
1    StringBuffer sb = new StringBuffer("abc");
2    String s = new String("abc");
3    sb.append("def");
4    sb.insert(1, "zzz");
5    s.append("def");
6    s.concat(sb);
7    s.trim();
```

Which of the following statements are true:

   a) The compiler would generate an error for line 1.
   b) The compiler would generate an error for line 2.
   c) The compiler would generate an error for line 3.
   d) The compiler would generate an error for line 4.
   e) The compiler would generate an error for line 5.
   f) The compiler would generate an error for line 6.
   g) The compiler would generate an error for line 7.

3. The difference between call by reference and call-by-value depends on:

   a) The return type of the method
   b) The type of formal parameters
   c) The number of parameters
   d) none of the above

1

4. What is the output of the following

```
String s1 = new String ("Amit");
String s2= new String ("Amit");
String s3 = "Amit";
String s4 = "Amit";
System.out.print (s1==s2+ "\t ");
System.out.print (s1.equals(s3) + "\t ");
System.out.print (s3!=s4 + "\t ");
System.out.println("Poddar".substring(3));
```

a) false   true   false   dar
b) false   true   false   Poddar
c) true   true   false   dar
d) true   true   false   pod
e) None of the above

5. How many lines of output will be generated by the following java program

```
i = 1;
while (i > 0) {
        if (i > 4)
            i = i – 4;
else
i = i + 1;
System.out.println('*');
        }
```

a) 0
b) 5
c) 6
d) 7
e) More than 7

6. Read the following code. Choose the correct answer.

```
public  int ABC ( ) {
        System.out.println("Inside Method ABC");
        public int XYZ( ) {
            System.out.println("Inside Method XYZ");
        }
    }
```

a) Nothing wrong with above code, the code will compile and run fine.
b) Code will compile, but will not run.
c) XYZ method should not be defined in method ABC.
d) XYZ method should not have a return type.
e) XYZ method should be declared private

7. **Given the following code what is the effect when a = 5 ?**

```java
public class Test {
    public void add(int a) {
        for (int i = 1; i < 3; i++)  {
            for (int j = 1; j < 3; j++) {
                if (a == 5)
                    break ;

                System.out.print(i * j& " "):
            }
        }
    }
}
```

a) Generate a runtime error
b) Print the values: 1 2
c) Print the values: 1 2 2 4
d) Produces no output
e) None of the above

8. **Look at the following program and pick the correct answer.**

```java
1    public class Test {
2        public static void main (String[ ] args) {
3            for (int i = 0; i < args.length; i++)
4                System.out.println(args[ i ]):
5        }
6    }
```

The program was run with command   *c:\> java Test*

a) Above program will not run: throw exception
b) Above program will run fine
c) Above program will not compile. Code at Line number 3 is incorrect.
d) Above program will not run: The command line must include one or more file names after *Test*.
e) None of the above.

9. **Look at the following class and pick the correct answer(s).**

```java
public class test {
    private static int a:
    private int b= 12;

    public test( ) { };

    public static void abc( ) {
        a = 10;
        b = b+ 20;
    }
}
```

a) Above class will compile.
b) Method abc cannot use an instance variable
c) Method abc cannot use a static variable
d) The constructor method should have a body

B. Output (39 pts)

SHOW THE STEPS OF YOUR WORK FOR ALL THE EXERCISES IN THIS SECTION

1. What will be output by the following code?

```java
public class MyFor {
   public static void main(String args[]) {
      int i, j ;
         outer: for (i=1;i <3;i++)
                  {
               inner:for(j=1; j<4; j++) {
                       if (j==2)
                         continue inner;
                         System.out.println("Value for i=" + i + " Value for j=" +j);
                       }

                  System.out.println("*****");
                  }
   }
}
```

2. What is the output of the following code?

```java
String s1 = new String("HELEO");
String s2 = s1.replace('E','V');
String s3 = "World";
s1.concat ("RAM");
System.out.println(s1);
System.out.println(s2);
System.out.println((s2+s3).charAt(5));
```

3. What is the output of the following code?

```
int a =5,j, i;
for (i = 1; i < 4; i++)  {
        j = 1;
        while( j++ <= i)
            System.out.print("#");

        System.out.println(i * j);
        }
```

4. Given the following class:

```
class Bidding{
    public static void main( String args[] ) {
        House h1, h2, h3;
        h1= new House(300);
        h2 = new House(400,150000);
        h1.setPrice(90000);
        h3=h2.upgradeHouse();
        System.out.print("the price for the first and second house are"+ h1.getPrice + ","+
h2.getPrice);
    }
}
```

```
class House{
        private double area.  int price;

        public House(double a) {
        area = a;
        price=0;
        }
        public House(double a, int p) {
        area = a;
        price = 100000;
        }
        public void setPrice(int p) {
        price = p;
        }
        public int getprice() {
        return price;
        }
        public House upgradeHouse(){
        return  new House(area+200, price+10000);
        }
}
```

(a) What is the output of the application Bidding?

(b) Write an overloaded method upgradeHouse that takes two integer arguments v1 and v2, and returns a new house with area incremented by v1, and the price incremented by v2.

....

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(c) Add a static variable *largestArea* to the class House and update the first constructor to allow the class House to keep track of the largest area of all the houses created so far.

```
class House{
    double area, int price;
```
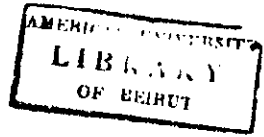
```
    ....................................................

    public House(double a) {
    area = a;
    price=0;
```

....

....

```
    }
    ...
}
```

(d) Write a static method that prints the largest area.

....

....

....

5. **Write a program segment that sets a** boolean **variable** *dangerous* **to** *true* **and stops reading data if** *pressure* **(a double variable being read in) exceeds 510.0 . Use** *dangerous* **as a flag to control the loop. Note: (using a do while loop)**

....

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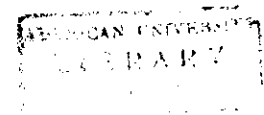
C. Programming (25 pts)

You are the accountant of a big company. The manager sent you a file "*raiseFile.txt*" containing the list of employees who are entitled for a raise this year, along with the raise percentage they will get over their original salaries.

The original salaries of the employees are stored in array *salaries* of type double where the salary of employee 0 is stored in salaries[0] , employee 1 is stored in salaries[1], and so on...

Write an application that
- A- reads from "*raiseFile.txt*" the employee Numbers and their raise percentages and updates their salaries in the array *salaries* accordingly.
- B- prints the list of all the employees with their salaries on the file "*Salaries.txt*".

The file **raiseFile.txt** looks like this:

empNum   space   Raise percentage

⟷   ⟷   ⟷

7   1   3
emp5   20
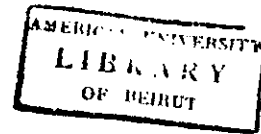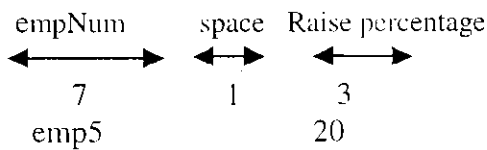
Note:
- Each employee Number consists of the word "**emp**" followed directly by a 4 digit number.
- **Your application should throw Exceptions.**

Sample input:

salaries

750
1000
550
400
375
1500
2000
650
800
850
600
400

raise _ □ ×

File Edit Format Help

```
emp2      5
emp4      20
emp1      5
emp8      10
emp10     7
```

Sample Output:

Salaries.txt _ □ ×

File Edit Format Help

```
emp0   750
emp1   1050
emp2   578
emp3   400
emp4   450
emp5   1500
emp6   2000
emp7   650
emp8   881
emp9   850
emp10  642
emp11  400
```
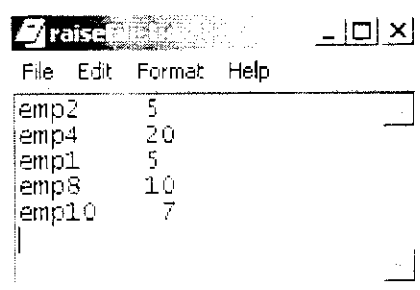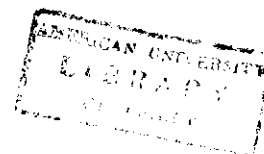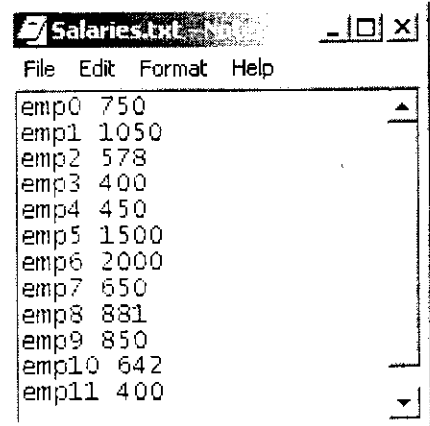
// code for import statement

....

public class Company {

public static void main (String args[]) ....

{

    // declaration and initialization of **a sample** array of the original salaries
    int salaries []= {750, 1000, 550, 400, 375, 1500, 2000, 650, 800, 850, 600, 400};

    // code to open existing file "raiseFile.txt" for reading

....

....

    // code to open file "Salaries.txt" for writing

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    // code to read from the "raiseFile.txt" the employee numbers, and raise percentages, and to update
    the salaries of those employees

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// code to print the list of all the employees with their salaries on the file "Salary.txt"

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   }
}

StringTokenizer methods:	**Some String Methods**	**Some StringBuffer Methods**
StringTokenizer(String s)		
StringTokenizer(String s, String d)	boolean equals(String s)	StringBuffer()
int CountTokens()	boolean	StringBufer(String s)
Boolean hasMoreTokens();	equalsIgnoreCase(String s)	void insert(int i,String s)
String nextToken();	int compareTo(String s)	void append(String s)
	String substring(int f, int t)	char charAt(int i);
	int indexOf(char c)	
	int lastIndexOf(char c)	
	String concat(String s)	
	char charAt(int i)	

3. Write an application that perform the following: (10 pts)

NO CREDIT WILL BE GIVEN IF YOU DO NOT CALL THE METHODS OF DATE

```
public class UseDate {
    public static void main ( String args[] ) {

//Creates the two dates 24/01/2000 and 22/02/2001

.......................................................................................
.......................................................................................
.......................................................................................
.......................................................................................


//Prints the second date using the Print method

.......................................................................................


//Compare date1 and date2 using the method before()
//and print the result of comparison

.......................................................................................
.......................................................................................
.......................................................................................
.......................................................................................


//Sets the day/month/year for the first date => 02/02/2000
//using the setDate method

.......................................................................................


//Prints the first date using the Print method

..................................  ...................................................


    }
}
```

11