Time: 9:00-10:30

Birzeit University
Computer Science Department
Engineering and Information Technology Faculty
Comp1331, **Midterm Exam,** August 15, 2022
Summer Semester 2021-2022

Student Name: Key Student Number: _____ Sec #:____

Put (✓) behind your instructor:
[ ] – Dr Mamoun Nawahda **[ ] - Mr.Hafez Barghuthi**

Question One [40 Marks] : Choose the most correct answer?

1. All the implicit and explicit casting statement are not valid except(ما عدا)

```
A. byte e = 256;
B. int c = 10.5;
C. float f = 1.10;
D. int ch = 'A';
```

2. public class Test { }
What is the prototype of the no arguments constructor?

```
A. Test()
B. public test()
C. public Test()
D. public void Test()
```

3. Which statement is true for the following code?

```
public void test(int x)
 {
  int odd = 1;
  if(odd)
  {
    System.out.println("odd");
  }
  else
  {
    System.out.println("even");
  }
}
```

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3. Which statement is true for the following code?

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public void test(int x)
 {
  int odd = 1;
  if(odd)
  {
    System.out.println("odd");
  }
  else
  {
    System.out.println("even");
  }
}
```

A. Print "odd" for odd values and "even" for even values.
B. Compilation fails.
C. Print "even" for odd values and "odd" for even values.
D. Print odd in all cases.

4. How many times 'Comp1331' is printed?

```
public class Test {
        public static void main(String[] args) {
                for (int i = 0; i < 5; i++) {
                        System.out.println("Comp1331");
                        i++;
                }
        }
}
```

A. 4
B. 5
C. 3
D. 2

5. Which statement is true about default constructor?

A. Compiler creates always a default constructor if it is not written.
B. Compiler creates a default constructor if only there are no other constructors.
C. Compiler is not creating default constructor at all.
D. None of the above.

6. The output for the following segment is

```
for(int i=0;i<=5;i++){
        if(i==3||i==5) break;
        System.out.print(i+" ");
        }
```

A. 0 1 2 3 4 5
B. 0 1 2
C. 0 1 2 4
D. 3 5

7. What is y after the following switch statement is executed?

```
int y = 0, x = 3;
switch (x + 3) {
        case 6:  y = 0;
        case 7:  y = 1;
        default: y += 1;
}
```

A. 0
B. 1
C. 2
D. 3

11. When must a program explicitly use the *"this"* reference?

A. Accessing a private variable.
B. Accessing a public variable.
C. Accessing an instance variable with the same name (shadowed) by local variable.
D. Accessing a local variable.

12. The overloaded method is a

A. Method with the same name and same signature.
B. Method with different name and different signature.
C. Method with the same name and different signature.
D. Method with different name and same signature.

13. which statement is true regarding instance and static methods.

A. Static methods can access both instance and static members.
B. Instance methods can access both instance and static members.
C. Static methods can access only instance members.
D. Instance methods can access only static members.

14. particular member belongs to a type itself, rather than to an instance of that type and shared across all instances of the class.

A. public B. private C. class D. static

15. A ***static way*** to call a static method called x in a class called Test is

A. Test.x()
B. new Test().x()
C. x()
D. None of the above.

1	2	3	4	5	6	7	8	9	10
D	C	B	C	B	B	C	A	B	C
11	12	13	14	15					
C	C	B	D	A					

Question TWO [40 Marks]

Part One [20Marks]: Write the output for the following

public class Test {
 	
public static void main(String[] args) {
System.*out*.println(*m*(5));
}
public static int m(**int** k) {
if(k==0 || k==1)
return 1;
else
return k**m*(k-1);
}
 	
}
	Output(5 Marks)
	
	120

public class Test {
 	
public static void main(String[] args) {
System.*out*.println(*m*(8, 28));
}
 	
public static int m(**int** x, **int** y) {
if (x == y)
return x;
else if (x < y)
return *m*(x, y - x);
else
return *m*(x - y, y);
}
 	
}
	Output(10 Marks)
	
	4
	
	In two words what is the purpose of m method:
	
	GCD
	greater Common divisors

public class Test {
 	
public static void main(String[] args) {
int[] x = { 1, 2, 3, 4 };
int[] y = x;
x = **new int**[2];
System.*out*.println(x[0] + " " + y[0]);
}
 	
}
	Output(5 marks)
	
	0 1

Part Two [20 Marks :5 for each]: Find the first error and justify why it is an error?

public class Test {
 	
public static void main(String[] args) {
int[] x = { 1, 2, 3, 4 };
for (**int** i = 1; i <= x.length; i++) {
System.*out*.println(x[i]);
}
}
 	
}
	Error:
	i<=x.length
	Out of bound

import java.util.Date;
public class A {
private static int *x*;
Date d = **new** Date();
 	
public static void main(String[] args) {
System.*out*.println(*x*);
System.*out*.println(d.toString());
}
}
	Error:
	d.toString()
	↓
	Cannot access instance
	in static

public class A {
private int x;
public A(**int** x) {
this.x = x;
}
public static void main(String[] args) {
A a = **new** A();
System.*out*.println(a.x);
}
}
	Error:
	new A()
	No default constructor

The following has a missing statement to generate random numbers between 10 and 15 inclusively (10 and 15 are included)
public class Test {
 	
public static void main(String[] args) {
for (**int** i = 0; i < 10; i++) {
int a = _____;
System.*out*.println(a);
}
}
}
	Missing statement:
	10 + (int)(Math.round()*6);

Question Three [30 Marks]

Write the code for the following (18 Marks)

A) An immutable class called Clock that represents 24 hours system and contains the following:

- Three private integer variables: hours, minutes and seconds.
- No-args constructor that initialize the clock to midnight 0:0:0
- A constructor that takes three integers and set the values of hours(between 0 and 23) minutes (between 0 and 59) and seconds(between 0 and 59) otherwise a default 0 value is given for wrong not valid values.
- Implement getElapsedTime method that returns a long in milliseconds from the default midnight time (0:0:0).
- Implement printInfo method that prints the clock as hours:minutes:seconds.
- You should write any appropriate setter/getter methods for attributes.

```
class clock {

private int hours;
private int minutes;
private int seconds;

public clock() {
hours = 0;
minutes = 0;
seconds = 0;
}

Public clock (int hours, int minutes, int seconds) {
if(hours >= 0 && hours <= 23)
this.hours = hours;
else
hours = 0;
```

3

2

3

B) (12 Marks) Write a driver class that creates an array of five clocks with random values. Your program should print the info about the latest clock and you should write the following method inside the driver class.

public static Clock latest(Clock [] array)

```
Public class Driver {
public static void main (String [] args) {
Clock [] array = new Clock [5];
Random r = new Random();        6 Mark
for(int i=0; i<5; i++)
array [i] = new Clock (r.nextInt(), r.nextInt(),
                       r.nextInt());
Clock late = latest(array);
late.printInfo();
}
public static Clock Latest (Clock [] array) {
Clock m = array [0];            6 Mark
for(int i=1; i<array.length; i++)
if (array[i].getElapsedTime() > m.getElapsedTime())
m = array[i]; }
return m;
```