



BIRZEIT UNIVERSITY
Computer Science Department
COMP231 – Midterm Exam

Q	1	2	3	4	5	Tota
M	16	15	5	15	29	80

First Semester 2019/2020

Time: 80 mins

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Question I: Choose the best answer [20 Marks]

- All the implicit or explicit casting statements are valid except
A) double c = 10; B) int b = 'A'; C) float d = 1.10; D) int e = (int)2.10; ✓
- When the source code is compiled without errors using javac command, the output generated is called
A) Output code. B) Error code. C) Byte code. D) Source code.
- 3) Suppose a String variable s is initialized to "Hello World". What is the value of s after executing s = s.substring(6,11);
A) Hello B) World ✓ C) Hello_ D) _World
- All of these are differences between constructors and regular methods except
A. Constructors have the same name as the class name while methods do not. ✓
B. Constructors will not return any datatype even void while methods can return any data type. ✓
C. Constructors are invoked by the new operation while methods are not.
D. Constructor do not accept any parameters while methods do.
- 5) Encapsulation means
A) A class contains a data field that references another object.
B) The data fields should be declared private. ✓
C) A class can contain another class.
D) A class without a default constructor.

6) The appropriate code that fills the blank without causing syntax or runtime errors

```
public class X {  
    java.util.Date x;  
  
    public static void main(String[] args) {  
        X t = new X();  
        System.out.println(_____);  
    }  
}
```

A)t.x

B)x

C)t.x.getTime()

D)x.getTime()

- 7) The difference between static and instance members is
- A. static methods can access both instance and static members while instance methods can access only instance members. ?
 - B. static methods can access only static members while instance methods can access static and instance members. ✗
 - C. static methods can access only static members while instance method can access only instance members. ✗
 - D. No restriction static and instance methods can access both static and instance members.
- 8) Overloading means
- A. Methods with the same name but different signature
 - B. Methods with different name and different signature
 - C. Methods with the same name and same signature
 - D. Methods with different name and same signature
- 9) All the following boolean expression evaluate to true after the execution of the following except
- ```
String s1 = "Hello";
String s2 = new String("Hello");
```
- A)  $s1 == s2$
  - B)  $s1.equals(s2)$
  - C)  $s1.equalsIgnoreCase(s2)$
  - D)  $s1.length() == 5$
- 10) The output for the following is
- ```
public class T {
```

```
public static void main(String[] args) {
    int [][] c = {{1,2,3,4,5}, {6,7,8,9}};
    System.out.println(m(c[0]));
}
public static int m(int[] arr) {
    int result=0;
    for(int i=1; i<arr.length; i++)
        result+=arr[i];
    return result;
}
}
```

$c[0] = \{1, 2, 3, 4, 5\}$

$result = 0 + c[1] + c[2] + c[3] + c[4]$
 $= 2 + 3 + 4 + 5$
 $= 14$

- A) 14
- B) 15
- C) 30
- D) Run time error

Question	1	2	3	4	5	6	7	8	9	10
Answer	C	C	B	D	B	X	A	X	A	A

C C B D B X A X A A

16

Question II: Output

[15 Marks]

A) What is the output of the following code? (5 Marks)

```
public class Test {
    int d;
    public Test(String t){
        System.out.println(t);
    }

    public static void main(String[] args) {
        Test t = new Test("Test");
        System.out.println(t.d);
    }
}
```

Output

Test
0

B) What is the output of the following code (10 Marks)

```
public class Test {
    public static void main(String[] args) {
        String s1="hello world hello 131_";
        String s2="";
        String [] array = {"131", "231", "world", "class", "hello", "bye"};
        for(int i=0; i<array.length;i+=2)
            s2 = s1.replaceAll(array[i], array[i+1]);
        s1=s1.replaceAll(array[4],array[5]);

        System.out.println(s2);
    }
}
```

~~s2 = "hello world hello 131"~~
① s2 = "hello world hello 231"
② s2 = "hello class hello 131"
③ s2 = "bye world bye 131"

Output

bye world bye 131

15

Question III: Find Errors

[20 Marks]

A) Find and explain all the errors (if any exists) clearly inside the box (10 Marks)

```
public class Test {
    int i;
    public void m(){
        System.out.println("m is invoked");
        m1();
    }
    public static void m1(){
        System.out.println("m1 is invoked");
    }

    public static void main(String[] args) {
        int k=i;
        m();
    }
}
```

non-static - 5

Error(s)
m method should be static
for access the main method to invoke it *Syntax.*
static word make the method accessed in any static or
instance method in the same class. ~~Static Error~~

5

B) Find and explain all the errors (if any exists) clearly inside the box (10 Marks)

```
public class Test {
    public static double m(int num){
        return num;
    }
    public static int m(int n){
        return n;
    }

    public static void main(String[] args) {
        System.out.println(m(2));
    }
}
```

casting.
must be diff. sig. - 10

Error(s)
~~There's No Error.~~
In the first method, the method should return
double not int, we can write: return (double)num;
Syntax error

5

Question IV: Strings

[15 Marks]

Write the code for a static method that takes a sentence and reverse only the words with length larger than 3 characters. (You must use the prototype written below).

Ex: "this is my short sentence"

Output: "siht is my trohs ecnetnes"

```
String
length():int
equalsIgnoreCase(String):boolean
split(deliemeter:String):String[]
charAt(index:int):char
substring(begin:int,end:int):String
replace(old:char,new:char):String
replaceFirst(old:String,new:String):String
replaceAll(old:String,new:String):String
```

```
public static String specialReverse(String inputStr){
```

```
String [] words = inputStr.split(" ");
```

```
for(int i=0 ; i < words.length ; i++)
```

```
if (words[i].length() > 3)
```

```
words[i] = new (StringBuilder(words[i]).reverse()).toString();
```

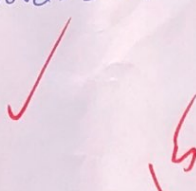
```
String s = words[0];
```

```
for (int i=1 ; i < words.length ; i++)
```

```
s += words[i] + " " ;
```

```
s += " " + words[i] ;
```

```
return s ;
```



Question V: Programming Skills

[30 Marks]

Write the code for the following

A) (18 Marks)

An Immutable class called **Cylinder** that contains the following

- ✓ Two private double variables; height and radius.
- ✓ One private Date variable to hold the date created for Cylinder object.
- ✓ A no-args constructor that initializes both radius and height to 1.0.
- ✓ Create one constructor that takes 2 parameters to set height and radius.
- ✓ Implement getVolume method that returns the volume of cylinder $\pi r^2 h$.
- ✓ Implement printInfo method prints all the info about cylinder.
- ✓ You should write any appropriate setter/getter methods for attributes.
- ✓ You should initiate the date object to current date inside the two previous created constructors.

```
import java.util.Date;
public class Cylinder {
    private double height;
    private double radius;
    private Date dateCreated;
    public Cylinder() {
        this(1.0, 1.0);
    }
    public Cylinder(double height, double radius) {
        this.height = height;
        this.radius = radius;
        this.radius = radius;
        dateCreated = new Date();
    }
}
```



```
Public static double getVolume() {  
    return (Math.PI * radius * radius * height);  
}
```

```
Public void PrintInfo() {  
    System.out.println("Cylinder: The radius = " + radius +  
        "\n The height = " + height +  
        "\n The date of the creating : " + DateCreated +  
        "\n The Volume = " + getVolume());  
}
```

```
Public double getRadius() {  
    return radius;  
}
```

```
Public double getHeight() {  
    return height;  
}
```

```
}
```

```
}
```

B) (12 Marks)

Write the driver class that creates an Array of five Cylinders and prints the info for the Cylinder with the largest volume. Let the radius and height be random numbers. You should write the following method inside the driver class

```
public static Cylinder largest(Cylinder [] array)
```

```
Public class Driver {
    Public static void main (String [] args) {
        Cylinder [] array = new Cylinder [5];
Cylinder [] array = new Cylinder [5];
        for (int i = 0 ; i < array.length ; i++)
            Cylinder [i] = new Cylinder (1 + (double) Math.random() * 100,
1 + (double) Math.random() * 100;
            1 + (double) Math.random() * 100);
        System.out.println ("The Cylinder with the largest volume is ");
        largest (array).PrintInfo ();
largest (array).PrintInfo ();
    }
    Public static Cylinder largest (Cylinder [] array) {
        Cylinder X = array [0];
        for (int i = 0 ; i < array.length ; i++)
            if (array [i].getVolume () > X.getVolume ())
                X = array [i];
        return X ;
    }
}
```

