King Saud University

College of Computer and Information Sciences
Computer Science Department

Course Code	**CSC 111**
Course Title	**Introduction to Programming**
Section No.	
Semester	**First 421**
Exam	**Final Exam**

Date	**21/12/2020**	**Duration: 3 Hours**

Student Name	
Student ID	

Course Learning Outcomes		**Relevant question**	**Full mark**	**Student mark**
CLO 1	a) Apply knowledge of computing and mathematics appropriate to the discipline;	**1**	25	
CLO2	i) Use current techniques, skills, and tools necessary for computing practice.	**2**	15	

Feedback/Comments:

Part I: Put your answers (**multiple choice questions**) in the following table.   (**25 Marks**)

Question	Answer
1	
2	
3	
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24	
25	

1) **With x = 0, which of the following are legal lines of Java code for changing the value of x to 1?**

```
A. x++;
B. x = x + 1;
C. x += 1;
D. x =+ 1;
```

a) A, B & C   b) A & D   c) A, B, C & D   d) B & C

2) **what is the output for the following code?**

```
public class A
  {
       public static void main(String args[])
      {
        int x = 5, y = 6, z=3, a;
          a= ++ y * x / y + y/z;
         System.out.print(a);
      }
}
```

a) 10   b) 11   c) 12   d) 7

3) **what is the output for the following code?**

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

int a=20, b=10, d=20;
boolean c = a>=10 && b<20 && d>10;
boolean e = a<=10 || b>5;
System.out.println(c&&e);
      }
}
```

a) false   b) true   c) Compiler error   d) None of the above

4) **What is the output of the following java snippet code?**

```
int a=3, b=8;
boolean c = a>5 && ++b>6;
System.out.println(b);
```

a) 8   b) 9   c) 6   d) Compiler error

5) What is the output of the following java snippet code?

```java
int a=5, b=9;
boolean c = a>1 || b++<10;
System.out.println(b);
```

a) 9   b) 10   c) 8   d) Compiler error

6) What is the output of the following java code?

```java
public class testClass {
    public static void main(String[] args) {
        int x=1;
        switch(x) {
            default: System.out.print("true");
            case 1: System.out.print("1");break;
            case 2: System.out.print("2");
        }
    }
}
```

a) true1   b) 12   c) Compilation error   d) None of the above

7) What is the output of the following java code?

```java
public class testClass {
    public static void main(String[] args) {
        int i;
        if(i==0 || i>0)
            System.out.println("Yes");
            if(i!=0) System.out.println("No");
            else System.out.println("Both");
        }
}
```

a) Yes   b) No   c) Compilation error   d) Both

8) What is the output of the following java code?

```java
public class testClass {
    public static void main(String[] args) {
        int i=0,j=9;
        if(i==0 || j/i>1)
            System.out.print("Yes");
            if(i!=0) System.out.print("No");
            else System.out.print("Both");
        }
}
```

a) YesNo   b) No   c) Compilation error   d) YesBoth

9) What is the output of the following java snippet code?

```
int cnt=0;
          while(true)
          {
            if(cnt > 4)
            break;
            if(cnt==0)
            {
              cnt++;
            }
            System.out.print(cnt + ",");
            cnt++;
          }
```

a) 0,1,2,3,4,
b) <mark>1,2,3,4,</mark>
c) 1,2,3,4
d) Compiler error

10) What is the output of the below Java code snippet?

```
int time=50;
do
{
System.out.print(time + ",");
time++;
}while(time < 53);
```

a) 50,50,50,
b) <mark>50,51,52,</mark>
c) 51,52,53,
d) Compiler error

11) What is the output of the below Java code snippet?

```
for(int i=1; i<=2;i++)
{ for(int j=1; j<=2;j++)
  {
    if( j > i )
    System.out.print(j );
  }}
```

a) 1,1,1
b) 1,2,2,
c) <mark>2</mark>
d) Compiler error

12) What is the output when the following method has been executed?

```
public void methodA()
 {
 int i, s = 0;
for (int k = 0; k < 5; k++) {
 i = 0;
do {
 i++;
s++;
 } while (i < k);
 }
 System.out.println(s);
 }
```

a) 15
b) 14
c) 11
d) 10

13) What is the last output when the code segment executes?

```
int p = 1;
int q = 1;
while (p < 6)
 {
   while (q < 6)
     {
       q += p;
       p++;
     }
 }
System.out.println(p + q);
```

a) 9
b) 14
c) Infinite loop
d) Compilation error

14) What is the output of the below Java program with a final local variable?

```
public class AClass {            public class Test {
    private int item;           public static void
    void change(int cars) {     main(String[] args){
        this.item = cars;       AClass obj = new AClass();
} }                             obj.change(30);
                                System.out.println(obj.item);
                                } }
```

a) 50
b) 30
c) 20
d) Compilation error

15) What is the output of the below java class?

```
public class Constructor {      public class Test {
private int count;              public static void main(String[] args){
Constructor(int count) {        Constructor con =new constructor();
System.out.println("Count="         } }
+ this.count);} }
```

a) Count=0
b) Count=10
c) Compilation error
d) None of the above

16) Java method signature is a combination of ___.

a) Return type
b) Method name
c) Argument List
d) All the above

17) The purpose of a Java constructor is ___.

a) Initialization of variables with passed data
b) Writing custom code
c) Accepting other objects as inputs
d) All the above

18) What is the output of the below Java program?

```
public class Constructor {          public class Test {
 int birds;                         public static void main(String[]args)
 Constructor() {                    {
      this(20);                     Constructor con = new Constructor();
}                                    }
 Constructor(int birds) {
  this.birds=birds;                }
  System.out.println("Birds=" +
birds);
      } }
```

a) Birds=0
b) Birds=10
c) <mark>Birds=20</mark>
d) Compilation error

19) What is the output of the below Java program with multiple methods?

```
public class Question {            public class Test {
void show(int a, char b) {         public static void main(String[] args){
System.out.print("KSU ");          Question obj = new Question();
}                                  obj.show(10, 'A');
void show(char a, int b) {         obj.show('B', 10);
System.out.println("CCIS ");       }      }
} }
```

a) KSU KSU
b) CCIS CCIS
c) <mark>KSU CCIS</mark>
d) Compilation error

20) What is the output of following program?

```
public class AClass {              public class Test {
     public static int var1;       public static void main(String[] args){
}                                  AClass.var1=5;
                                   AClass obj1 = new AClass();
                                   AClass obj2 = new AClass();
                                   obj1.var1++;
                                   System.out.println(obj2.var1);
                                   } }
```

a) 5
b) <mark>6</mark>
c) 0
d) Compilation error

21) What is wrong in the following code (given that both classes are written in the same java file)?

```
class TempClass {
  int i;
  public void TempClass(int j) {
    int i = j;
  }
}

public class C {
  public static void main(String[] args) {
    TempClass temp = new TempClass(2);
  }
}
```

a) The program has a compilation error because TempClass does not have a default constructor.
b) The program has a compilation error because TempClass does not have a constructor with an int argument.
c) The program compiles fine, but it does not run because class C is not public.
d) The program compiles and runs fine.

22) What is the output of the following program, if any?

`public class Customer {`
`public String name; // line 2`
`public int id;`
`public Customer(String n, int d) //line 5`
`   { set(n,d); }`
`public void set(String s, int i){//line 8`
`    name = "null";`
`    id = 10; }`
`}`
	`import java.util.Scanner;`
	`public class FinalTest {`
	`public static void main(String[] args)`
	` {`
	`Scanner kb = new Scanner(System.in);`
	`Customer cst = new Customer("Saad", 1111);`
	`System.out.println("name="+cst.name+" ID="+`
	`cst.id);`
	`}`
	`}`

a) name=Saad ID=1111
b) name=null ID=10
c) There will be a compilation error caused by line 2 in the class "Customer".
d) There will be a compilation error caused by line 5 in the class "Customer".
e) There will be a compilation error caused by line 8 in the class "Customer".

9

23) What is the output of the following program ?

```public class Test2 {``` ``` public double display(int x, int y)``` ``` {``` ``` System.out.print(x+y);``` ``` return x+y;``` ``` }``` ``` public int display(int y, int x)``` ``` {``` ``` System.out.print(x+y);``` ``` return x+y;``` ``` }```	```Public class CTest2``` ```{``` ```public static void main(String[]args)``` ```{``` ``` Test2 t2 = new Test2();``` ``` double d = t2.display(3, 4);``` ```}``` ```}```

a) Compiler error because methods have same signature, so we have duplicate method
b) 7
c) 14
d) 7 7
e) A & B

24) What is the output of the following code fragment?

```
int[] numbers = {2, 5, 3, 1, 6};
int number = numbers[ numbers[1] ];
System.out.println( number );
```

a) 5
b) 6
c) 2
d) Run-time error (ArrayIndexOutOfBoundsException)
e) 1

25) What is the output of the following program, if any?

```java
public class Evaluate {
    public static void main(String args[]) {
        int arr[] = { 3, 2, 6, 5, 4, 3};
        int n = 5;
        n = arr[arr[n] / 2];
        System.out.println(arr[n] / 2);
    }
}
```

a) 2
b) 3
c) 4
d) 6
e) There is a run-time error.

Part II (15 Marks)

Q1 (5 Marks): **Assume we have the following class:**

```
class Q1 {
    private int a;
    private int b;
    private int c;
    public void setA(int a){this.a = a;}
    public void setB(int b){this.b = b;}
    public void setC(int c){this.c = c;}
    public int getA(){return a;}
    public int getB(){return b;}
    public int getC(){return c;}

    public int m1(int a, int b)
    {
        for (int i = 0; i < 5; i++)
        {
            a++;
            b++;
        }
        return a + b;
    }
    public boolean m2(int x, int y)
     {
        a = x + 1;
        b = y / 2;
        return m1(a, b) + x + y - a - b < c;
     }}
```

A- Suppose we run the code:

```
            Q1 obj = new Q1();
            obj.setA(3); obj.setB(2); obj.setC(1);
            int x = obj.m1(1,2);
```

what will be the value of x, obj.a, obj.b, obj.c?

Answer A: ……………………………………………………...

B- Suppose we run the code:

```
            Q1 obj = new Q1();
            obj.setA(3); obj.setB(2); obj.setC(1);
            boolean b = obj.m2(1,2);
```

what will be the value of b, obj.a, obj.b, obj.c?

Answer B: ……………………………………………………...

Answer

A.	13	3	2	1	2 pts
B.	false	2	1	1	3 pts

Q2 (5 Marks): **Complete the following program by filling in each of the dotted(…….) lines, so its output will be the following:**

30 45

```
public class CR {
private int ……………… ;
public ……………… . (int num)
{
this.num=…………*2;
}
…………….. get()
{
return num;
}
public static void main(String args[]) {
CR ………… =new CR(20);
CR ……….. = new CR(..);
// display the value of the instance attribute of the first object.
System.out.print( …..+ " ");
// display the value of the instance attribute of the second object.
System.out.println( ………….);
}
}
```

Answer:

```
public class CR {
private int num ;      0.5pt
public CR (int num)    0.5pt
{
this.num=num*2;        0.5pt
}
public int getnum()    1pt
{
return num;
}
public static void main(String args[]) {
CR obj =new CR(20);           0.75 pt
CR obj1 = new CR(15);         0.75 pt
System.out.print( obj.getnum()+ " "); 0.75
System.out.println( obj1.getnum());   0.75
} }
```

13

Q3 (5 Marks): The method **isSorted(int[] numbers)** checks if an array
is sorted in ascending order. The method returns **true** if the
array numbers[] is sorted, and returns **false** otherwise.
For example:

When numbers = {-1 , 2 , 4 , 4 , 6 , 20} the method should
return **true.**
When numbers = {8 , 2 , 4 , 2 , 6 , 20} the method should return
false.

Complete the implementation of isSorted by filling in each of the dotted(.......) lines:

```
public ............................. isSorted(int[] numbers) {
    for (int i = 0; i < ...........................................; i++) {
        if (...................................................)
            return ...................................................;
    }
    return ...................................................;
}
```

Answer:

public boolean isSorted(int[] numbers) {   1 pt

    for (int i = 0; i < numbers.length - 1; i++) {   1 pt

        if (numbers[i] > numbers[i + 1])   1 pt

            return false;   1 pt

    }
    return true;   1 pt

}

14