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MAIN EXAMINATION

JANUARY – APRIL 2022

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE

REGULAR PROGRAMME

DIT 008: OBJECT ORIENTED PROGRAMMING (JAVA)

Date: APRIL 2022

Duration: 2 Hours

INSTRUCTIONS: Answer Question ONE and any TWO Questions

- Q1.a) i) What does IDE, JDK and JRE stand for? **(3 Marks)**
- ii) Are NetBeans and Eclipse different languages from Java, or are they dialects or extensions of Java? **(1 Mark)**
- iii) Why do we regard Java as a case sensitive programming language? **(1 Mark)**
- iv) What is a comment? How do you denote a comment line and a comment paragraph? **(3 Marks)**

b) Show the output of the following code:

```
public class Test {  
  
    public static void main(String[] args) {  
  
        System.out.println("3.5 * 4 / 2 - 2.5 is ");  
  
        System.out.println(3.5 * 4 / 2 - 2.5);  
  
    }  
}
```

}

(2 Marks)

c) Identify and fix the errors in the following code:

```
1 public class Welcome {  
2     public void Main(String[] args) {  
3         System.out.println('Welcome to Java!');  
4     }  
5 }
```

(4 Marks)

d) How do you write a statement to let the user enter a double value from the keyboard? What happens if you entered 5a when executing the following code?

```
double radius = input.nextDouble();
```

(4 Marks)

e) Which of the following identifiers are valid? Which are Java keywords?

miles, Test, a++, --a, 4#R, \$4, #44, apps

class, public, int, x, y, radius

(3 Marks)

f) What are the naming conventions for class names, method names, constants, and variables? Which of the following items can be a constant, a method, a variable, or a class according to the Java naming conventions?

MAX_VALUE, Test, read, readDouble

(4 Marks)

g) If today is Tuesday, what will be the day in 100 days?

(5 Marks)

Q2.. a) Identify and fix the errors in the following code:

```
1 public class Test {  
2     public void main(string[] args) {  
3         double i = 50.0;  
4         double k = i + 50.0;  
5         double j = k + 1;  
6  
7         System.out.println("j is " + j + " and  
8         k is " + k);  
9     }  
10 }
```

(6 Marks)

b) Translate the following algorithm into Java code:

Step 1: Declare a double variable named miles with initial value 100.

Step 2: Declare a double constant named KILOMETERS_PER_MILE with value 1.609.

Step 3: Declare a double variable named kilometers, multiply miles and KILOMETERS_PER_MILE, and assign the result to kilometers.

Step 4: Display kilometers to the console.

What is kilometers after Step 4?

(10 Marks)

c) Show the output of the following code:

```
float f = 12.5F;
```

```
int i = (int)f;
```

```
System.out.println("f is " + f);
```

```
System.out.println("i is " + i);
```

(4 Marks)

Q3. a) Write an if statement that increases pay by 3% if score is greater than 90, otherwise increases pay by 1%. **(4 Marks)**

b) What is the output of the code in (i) and (ii) if number is 30?

```
(i)
if (number % 2 == 0)
    System.out.println(number + " is even.");

System.out.println(number + " is odd.");
```

```
(ii)
if (number % 2 == 0)
    System.out.println(number + " is even.");
else
    System.out.println(number + " is odd.");
```

(4 Marks)

c) What is the output of the following code if number is 14, 15, or 30?

```
(i)
if (number % 2 == 0)
    System.out.println
        (number + " is even");
if (number % 5 == 0)
    System.out.println
        (number + " is multiple of 5");
```

(6 Marks)

```
(ii)
if (number % 2 == 0)
    System.out.println
        (number + " is even");
else if (number % 5 == 0)
    System.out.println
        (number + " is multiple of 5");
```

(6 Marks)

Q4. a) Assuming that x is 1, show the result of the following Boolean expressions.

- i) (true) && (3 > 4)
- ii) !(x > 0) && (x > 0)
- iii) (x > 0) || (x < 0)
- iv) (x != 0) || (x == 0)
- v) (x >= 0) || (x < 0)

vi) $(x \neq 1) == !(x == 1)$

(6 Marks)

b) Write a switch statement that displays Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, if day is 0, 1, 2, 3, 4, 5, 6, accordingly. **(14 Marks)**

5. a) Rewrite the following conditional expressions using if-else statements.

i) $\text{score} = (x > 10) ? 3 * \text{scale} : 4 * \text{scale};$ **(4 Marks)**

ii) $\text{tax} = (\text{income} > 10000) ? \text{income} * 0.2 : \text{income} * 0.17 + 1000;$ **(4 Marks)**

iii) $\text{System.out.println}((\text{number} \% 3 == 0) ? i : j);$ **(4 Marks)**

b) Show the output of the following program:

```
public class Test {
    public static void main(String[] args) {
        char x = 'a';
        char y = 'c';

        System.out.println(++x);
        System.out.println(y++);
        System.out.println(x - y);
    }
}
```

(6 Marks)

c) Suppose that s1, s2, and s3 are three strings, given as follows:

```
String s1 = "Welcome to Java";
String s2 = "Programming is fun";
String s3 = "Welcome to Java";
```

What are the results of the following expressions?

i) $s2 == s3$ **(1 Mark)**

ii) $s1.charAt(0)$ **(1 Mark)**

END