1. Consider a set of Java statements:
   ```java
   int k = 3 / 4;
   k = 3 + k * 3;
   k = 3 / k + k / 3;
   ```
   What is the value of \( k \) after these statements are executed? (3 marks)

   Answer:

   Working:

2. Given a String \( s \), write a boolean expression that is true if the length of \( s \) is even and false otherwise. (3 marks)

   Answer:

3. The signature of a method consists of
   (a) the name;
   (b) the name, the return type and the parameter types;
   (c) the name and the parameter types;
   (d) the access modifier, the return type, the name and the parameter types.

   What is the right answer? (3 marks)

   Answer:
4. Which of the following are valid Java identifiers (i.e., names of variables or methods)?

(a) mutator
(b) it’s
(c) Integer
(d) small_int
(e) float

(5 marks)

Answer:

5. Identify seven compile-time errors in the following Java code:

```java
public CLASS bar {
    public static int main(String[] args) {
        int x = 0, int y;
        y = x / 2.0;
        if (y = 3)
            System.out("result: " + (x == y));
        return ok;
    } // end of class bar
```

How would you correct the errors you have found? (11 marks)

Answer:
6. Implement a method that, given a mark from 0 to 100, returns
   (i) “distinction” if the mark is 70 or above;
   (ii) “merit” if the mark is between 50 and 69 (inclusive);
   (iii) “pass” if the mark is between 40 and 49 (inclusive);
   (iv) “fail” if the mark is below 40.

   Your method should take one argument, the mark, of type int, and return a String.

   Answer:

7. What is printed as a result of executing the following fragment of code?

   ```java
   int i = 0;
   while (i > -6) {
       System.out.print(i - 1);
       i = i - 2;
   }
   ```

   Answer:

   Working:

8. What is the type and the value of the following expression

   ```java
   s.length() + b * 3.0 > 3 && s.length() / 2 > 1
   ```

   if s is "1" and b is 3.3.

   Answer:
9. Implement a method that returns true if its argument of type String ends with "tom"; otherwise, the method should return false. (10 marks)

Answer:

10. Transform the following for loop into a while loop and explain its action.

```java
int s = 0;
for (int k = 20; k > 0; k--)
    if (k % 2 == 0)
        s = s + k;
System.out.println("result: "+ s / 2); // (17 marks)
```

Answer:
11. Implement a method `getIntRoot` that takes an integer `a` and returns $\sqrt{a}$, the square root of `a`, if `a` is a square of an integer (and 0 otherwise).

Implement another method that prints out all Pythagorean triples $(a, b, c)$ such that $a$, $b$ and $c$ range from 1 to 100 and $a \leq b \leq c$. (A triple $(a, b, c)$ is called Pythagorean if $a^2 + b^2 = c^2$.)

*Hint*: use nested loops to enumerate all pairs $(a, b)$ with $a \leq b$ and check, be means of `getIntRoot`, whether $a^2 + b^2$ is a square of an integer, $c$.

*Answer:*