

General Quiz on Java Language**15 marks**

1. One of the components of a computer is ist CPU. What is a CPU and what role does it play in a computer? **1 mark**
2. What is the difference between a compiler and an interpreter? **1 mark**
3. If you have the source code for a Java program and you want to run that program, you need both a compiler and an interpreter. What does the Java compiler do, and what does the Java interpreter do? **1 mark**
4. Java is an Obeject Oriented Programming language. What is an object? **0,5**
5. What is a variable? There are four different ideas associated with variables in Java. Try to mention all four aspects in your answer. **1 mark**
6. Java is a platform-independent language. What does this mean? **0,5**
7. Briefly explain what is meant by the syntax and the semantics of a programming language. Give an example to illustrate the difference between a syntax error and a semantics error. **1 mark**
8. One of the primitive types in Java is boolean. What is the boolean type? Where are boolean values used? What are its possible values? **1 mark**
9. In Java, classes have two fundamental different purposes. What are they?
10. What is an algorithm? **0,5 mark**
11. Explain briefly what is meant by pseudocode and how is it useful in the development of algorith. **0,5 mark**
12. What is the main difference between a while loop and a do..while loop? **1**
13. What is a constructor? What is the purpose of a constructor in a class? **0,5**
14. What is meant by the terms instance variable and instance method? **0,5**
15. Object Oreinted programming uses classes and objects. What are classes and what are objects? What is the relationship between classes and objects? **1 mark**
16. What is meant by the terms subclass and superclass? **0,5 mark**
17. Modify the following class so that the two instance variables are private and there is a getter method and a setter method for each instance.
public class Player {

String name;

int score;

}

1 mark

18. Explain the term polymorphism. **0,5 mark**
19. For this problem, you should write a very simple but complete class. The class represents a counter that counts 0,1,2,3,4,... The name of the class should be Counter. It has private instance variable representing the value of the counter. It has two instance methods: increment() adds one to the counter value, and getValue() returns the current counter value. Write a complete definition for the class Counter. **1 mark**
20. This problem uses the Counter class from the previous question. The following program is meant to simulate tossing a coin 100 times. It should use two Counter objects, headCount and tailCount, to count the number of heads and the number of tails. Fill in the blanks so that so that it will do so:

```

Counter headCount, tailCount;
tailCount = new Counter();
headCount = new Counter();
for( int flip = 0; flip < 100; flip++) {
    if(Math.random() < 0,5) //there is 50/50 chance that this is true
    -----; // count a head
    else
    -----; // count a tail
}
}
System.out.println("There were" + ----- + „heads.“);
System.out.println("There were" + ----- + „tails.“); 1,5 marks

```

Exercise One: The season of plums, we are living it. If you have N plums, then you have N/12 dozen plums, with N%12 plums left over. Write a program that asks the user how many plums he or she has and tells the user how many dozen plums he or she has and how many extra plums are left over. A gross of plums is equal to 144 plums. Extend your program so that it will tell the user how many gross, how many dozen and how many left over he or she has.

Exercise Two: Define a two-dimensional array, data [11][5] of type double. Initialize the elements in the first column with values from 2.0 to 3.0 inclusive into steps of 0.1. If the first element in a row has value x, populate the remaining elements in each row with the values $1/x$, x^2 , x^3 , and x^4 . Output the values on the array with each row on a separate line and with heading for each column. **2,5 marks**