**A. Scope (based on the Weekly Schedule on Blackboard)**

1. The Java Platform

2. Java Classes and Objects

3. ArrayList, Inheritance and Polymorphism

4. Java Interfaces and Polymorphism

5. Java Packages, Exception Handling

Note: You will not be tested about JUnit and Eclipse.

**B. Duration: 90 minutes.**

**C. What can you use during the test?**

1. This test has four parts (total: 30+20+10+20 = 80 marks).

2. Write down all your answers clearly with a PEN.

Your answers will not be marked if they are hard to read.

3. You are allowed to use a hand-written reference sheet (2-sided). Your name and

student id must be written on both sides.

4. You must turn off your mobile phone and put it away in your backpack.

Note: Your reference sheet must not include a) my code examples and b) the sentences from The Java Tutorials.

**D. Types of Questions**

1. Short Answers

2. Short Debugging Questions

3. Short Walkthrough

4. Short Word Problem

**E. How to prepare for the test?**

1. Reading

Read related topics in The Java Tutorials (<http://docs.oracle.com/javase/tutorial/>).

2. Review

a) all the workshops that you've completed,

b) my examples explained in the class,

c) the questions posted on Blackboard.

**BTP100 Group Discussion Questions (Week 1)**

1. **What is bytecode? Is it platform-dependent or platform-independent?**

* Java Bytecode is an instruction set for the JVM. It compiles the code written in .java into .class file so that JVM can understand it. Because of that, java is known as a platform-independence as it can run anywhere.

1. **What is a Java Virtual Machine? Is it platform-dependent or platform-independent?**

* Has a specification, where the implementation provider is independent to choose the algorithm because the implementation is provided by Oracle (known as JRE – Java Runtime Environment). By the time running, an instance of runtime is also created, known as JVM, whether it is on Eclipse or CMD.

1. **Describe the basic structure of a Java class.**

* Contain a package where all the related file will be keep together and run all at the same times when necessary. A specific class type to specify the data type and declared public so that files in the same package can access its contents. A distinct class name so it doesn’t look the same or similar to other class within the package. Data member as instances or static, and constructors to initialized the data member. Moreover, at least 1 user-defined methods must be include as well as a main() function.

1. **How is the keyword “private” used in a Java class? When do you want to use it?**

* Private keyword is use when the variable is wish stay private for that classes. That being said, if the user want to fetch a value or assign a value, they would have to do that through getter and setter

1. **What is the default access control level in a Java class?**

* Default by class, package, subclass and world is public

1. **How is the keyword “this” used in a Java class?**

* This reference to the local object that has been initialized within the class

1. **What is the Java term that you use to refer to the concept of functions in C/C++?**

* Method

1. **What is the purpose of implementing the toString() method in a Java class?**

* toString() help developer to display the data when the object is called instead of displaying an address of the object in memory.

1. **What will happen if the toString( ) method is not implemented in a Java class?**

* It will display the address of the initialized object in the memory.

1. **What is the parameter passing mechanism in Java?**

* **Formal parameters**: function\_name(datatype variable\_name)
* **Actual** **parameters**: function\_name(variable\_name,…)
* **Pass By Value**: only specified value in the main function will be passed to another function. However, if the other function doesn’t have a return, the value in the main function remain the same. (initialized int a and b in main and then just passing the value of a and b, but didn’t pass when the object first initialized)
* **Pass By Reference**: pass a references of the value specified in the main function and allow other methods to modifies it, (pass a references of the value to the object when initialize it.)

1. **How long can a Java object stay alive?**

* Object is created with a keyword new and it will be destroy when there is no references to the object or the object no longer contain a value (can be either null or 0). When the object is no longer have a value, java garbage collect will do it.

1. **How is the keyword “static” used in a Java class?**

* Known as a variable that has common value across classes. It is usefull when setting a array of object (for example, school, with studentID and student name). Since school’s name will be the same across all student information, school name should be in static to reduce memory. If user wish to change the school name, they should use a modifer such as ClassName.schoolName to change it.

1. **Why is the keyword “static” used to qualify the main method in Java?**

* Static will create prioritize in the main that it is the one should be execute first before any attributes or methods. Therefore, if we don’t specify the main as static, other object will be first-come-first-serve and cause some memory waste in the beginning.

**BTP100 Group Discussion Questions (Week 2)**

1. **What is the difference between a primitive date type and a reference data type in Java?**

* Primitive data type is type such as int, double, string, boolean, etc.,
* Reference data type is type such as Object referencing (Student Jack = new Student()) or type of Strings, Arrays
* Primitive Data Type is Type already defined and easily to change, while References Data Type is Type that depends on the Object, in which the Object may have multiple Primitive Data Type or another references.

1. **What is the reason of implementing the equals() method in a Java class?**

* Equals() method is implemeted so that developer can compare 2 object if they have the same type and also have the same values. Sometimes developer receive an object that they are unsure about the type so they will just use that to compare and see.

1. **What will happen if the equals() method is not implemented in a Java class?**
2. **What is the reason of implementing the hashCode() method in a Java class?**

* To ensure that 2 equals object will always produce 2 equal integer. hashCode() always return an integer, and it is independent from equals() method. This mean, if the object isn’t equals in equals(), it doesn’t have to be different in hashCode().

1. **What will happen if the hashCode() method is not implemented in a Java class?**

* Default hashCode() will be applies and if 2 objects is equals in equals(), they are not guarantee to be equals in hashCode(), simply is that default hashCode() generates different values for different object.

1. **What is the fundamental difference between a Java array and a C/C++ array?**

* Java array can be created and not specified with any length while C/C++ will required a length from the beginning.

1. **How do you use the variable “length” with a Java array?**

* To check for the number of elements in the array, since array are unspecified with the length.

1. **What is the advantage of using an ArrayList (vs a Java array)?**

* ArrayList allow developer to store an array of any type even object while normal Java Array is just able to store the data type of the specified data type.

1. **After invoking the remove( ) method on an ArrayList, what will happen to the index numbers associated with the elements that remain in the ArrayList?**
2. **What does the toString( ) method in the Object class return?**

* It returns a string type contain a display information when the object is called
* *Static Variable created when the program start and kill itself when the program ends, can be accessed when calling ClassName.VariableName, and there is only 1 copy value of the object regards the number of object is used and created with class or across classes.*
* *Instance Variable created using the keyword new and kill itself when the object is destroy. Values must be references by more than one method or constructor. If object is with static methods, fully qualified name must be use as ObjectReference.VariableName.*
* *One class can only extend one parent class but can implements more than one interfaces*
* *A static method in superclass can only be hidden if the subclass also have the same static method*
* *A static method cannot be override a default method declared in superclass*
* *If a subclass has overrides a static method in the super class, when the subclass is calling that static method, only the one exist in the sub class will be display. However, if the code specifies that the static method has to be run from the super class, they can do superClass.testStaticMethod().*
* *If the same method with the same name as well as same type of parameters exist in superClass and interface, priority will be given to superClass, given that non of them is static. That being said, if a class does not inheritance from the superClass and only implements from the interface, priority will be for interface as first come first serve. If developer want a specific superClass or interface to run, they have to specify as superClass/interface.super.method()*
* *If a class contain an abstract method, the class itself will be abstract as well. If the subClass doesn’t provide any implementation for the abstract method when extends, it has to declare itself as an abstract too*
* *Abstract is similar with Interface, the only differences is abstract method cannot be specify as public, private or protected, nor it also can’t have any static/final instances*
* *Use abstract if the other class is closely related or within the class, and use interface if it expects to be implemented by other class.*