TITLE	HET: DIPLOMA IN INFORMATION TECHNOLOGY
SUBJECT	Programming 2B
SUBJECT CODE	PRG220
TEST/EXAM	Test Memo
SEMESTER	2nd
DATE WRITTEN	06 September 2021

NUMBER OF PAGES	12
TOTAL MARKS	100
DURATION	2 HOURS
PASS MARK	50%
WEIGHTING	20%
EXAMINER	Thandanani Dube

REQUIREMENTS:

Learner Requirements:

Equipment Requirement:

This paper consists of: **100 Marks**

1. Section A: Short Questions   30 Marks
2. Section B: Medium Questions   10 Marks
3. Section C: Long Questions   60 Marks

Unless otherwise stated, please answer ALL questions.

Please read the assessment rules and regulations that follow

Learners are warned that contravening any of the examination rules or disobeying the instructions of an invigilator could result in the examination being declared invalid. Disciplinary measures will be taken which may result in the students' expulsion from Damelin.

ASSESSMENT RULES AND REGULATIONS

Please ensure that you have read and fully understand the following assessment rules and regulations prior to commencing with your assessment:

1. To be permitted access to the examination, a learner must arrive with:
   1.1 an Identity Document or other official proof of identity (for example, - a student card, passport or driver's licence card with photo); and
   1.2 The required exam stationery.
2. No learner may enter the examination room more than 30 minutes after the examination sitting has commenced and no candidate may leave the room less than one hour after the examination sitting has commenced.
3. No extra time will be allowed should a student arrive late.
4. All learners must sign the *Attendance Register* for the examination on arrival.
5. It is the responsibility of learners to familiarise themselves with the examination rules prior to sitting for the examination.
6. All examinations are to be written on the date and time officially stipulated by the College.
7. It is the responsibility of learners to ensure that they are writing the correct paper and that the question paper is complete
8. Cell phones must be switched *off* prior to entering the exam venue. Cell phones and wallets may be placed under candidates' chairs rather than at the front of the room.
9. Learners may not handle cell phones or wallets during the exam.
10. No weapon of any description may be taken into the assessment room.
11. All personal belongings are to be placed at the front of the examination room. Personal belongings brought to the examination are at the owner's risk.
12. Smoking is not permitted and learners will not be allowed to leave the examination room in order to smoke
13. Once the examination has commenced, all conversation of any form between candidates must cease until after candidates have left the room, after the examination.
14. *Only* the official College examination book, as supplied by the College, may be used.
15. Learners must ensure that their student number is written on the answer book.
16. Learners are responsible for ensuring that they follow the instructions in the examination for submitting their answers.
17. Please read the instruction appearing on the examination paper carefully
18. The number of every question must be clearly indicated at the top of every answer.
19. No pages may be torn out of the answer book. All question papers and scrap paper must be handed to the invigilator after the examination.
20. Learners finishing earlier are to leave the examination room as quietly as possible on the instruction of the invigilator, and may not talk until outside the building where the examination is being written.
21. Only under exceptional circumstances will a learner be permitted to leave the examination room during the examination, and if the invigilator gives permission. An invigilator must accompany the learner. Only one learner at a time may be absent from the examination room.
22. Candidates may not act dishonestly in any respect.

SECTION A: SHORT QUESTIONS **[30]**

 Answer all questions in this section.

 Question 1: **[20]**

1.1 How are instructions converted, or compiled, through a series of steps into machine language?

A. 1s and 0s √

B. C++

C. Java

D. Syntax

1.2 What is a Computer program?

A. Software √

B. Google

C. HTML

D. Explorer

1.3 What are the keywords of high-level programming language?

A. "read," "write," or "add" √

B. 1s and 0s

C. Compiler

D. Debug

1.4 What does an Interpreter do?

A. Translates machine language

B. Executes source code

C. Reads the source code √

D. Interpret 1s and 0s

1.5 What is an Assembler?

A. A java operator

B. A method

C. A set of instructions that debug code

D. A computer program that translates instructions written in an assembler language into machine code √

1.6 When different programmers write the same program in differing ways and all get the correct result. what is that know as?

A. Programming Logic √

B. Code Logic

C. Syntax compiling

D. Method sequence

1.7 How to remove all syntax errors and logical errors from a program?

A. Syntax error remover method

B. Debugging √

C. Code compiler

D. Try and catch method

1.8 What does OOP mean?

A. Organized-oriented programming

B. Organized-open programming

C. Opportunity-oriented programming

D. Object-oriented programming √

1.9 What are objects defined as?

A. instance of a class √

B. Parent class

C. Variables

D. Strings

1.10 Name a technique of packaging an object's attributes and behaviours into a cohesive unit?

A. Inheritance

B. Declaring

C. Encapsulation √

D. Initializing

Answer all questions in this section.

State whether true or false:

Question 2: [10]

2.1 When you place objects in order, beginning with the object that has the lowest value, you are sorting in ascending order; conversely, when you start with the object that has the largest value, you are sorting in descending order.

True

2.2 When mathematicians use a two-dimensional array, they often call it a Algorithm or a table; you might have used a two-dimensional array called a spreadsheet.

False, When mathematicians use a two-dimensional array, they often call it a matrix or a table; you might have used a two-dimensional array called a spreadsheet.

2.3 In Java and all object-oriented languages, inheritance is a mechanism that enables one class
to inherit, or assume, both the behaviour and the attributes of another class.

True

2.4 In a bubble sort, you continue to compare pairs of items, swapping them if they are out of
order, so that the smallest items "bubble" to the top of the list, eventually creating a sorted list.

True

2.5 The ability to use inheritance in Java makes programs easier to write, less error prone, and
more quickly understood.

True

Define the following terms:

Question 3: [10]

1. Application software: A computer program that enables interaction between the user and the Software/ hardware components of computer.

2. Subclass: is a specialized version of a superclass. It inherits all of the instance variables and methods defined by the superclass and adds its own, unique elements.

3. Late binding: Normally, Java resolves calls to methods dynamically, at run time.

4. Early binding. since final methods cannot be overridden, a call to one can be resolved at compile time.

5. Final: Sometimes you will want to prevent a class from being inherited. To do this, precede the class declaration with final. Declaring a class as final implicitly declares all of its methods as final, too.

Answer all questions in this section.

Practical question:

Question 4: [30]

Suppose you want to create classes to represent different animals, such as Dog and Cow. You can create a generic abstract class named Animal so you can provide generic data fields, such as the animal's name, only once. An Animal is generic, but all specific Animals make a sound; the actual sound differs from Animal to Animal. If you code an empty speak() method in the abstract Animal class, you require all future Animal subclasses to code a speak() method that is specific to the subclass.

The example shows an abstract Animal class containing a data field for the name, getName() and setName() methods, and an abstract speak() method.

There are 10 errors, correct the errors in the program to get it to function

```
public abstract class Animal
{
private String name;
public abstract void speak();
public String getName()
{
return name;
}
public void setName(String animalName)
{
name = animalName;
}
}
```

```
Class Dog extends Animal.
{
public void speak()
{
System.out.println("Woof!");
```

```java
}
}

public class Cow extends Animal
{
public void speak()
{
System.out.println("Moo!");
}
}
public class Snake extends Animal
{
public void speak()
{
System.out.println("Ssss!");
}
}
public class UseAnimals
{
public static void main(String[] args)
{
Dog myDog = new Dog();
Cow myCow = new Cow();
Snake mySnake = new Snake();
myDog.setName("My dog Murphy");
myCow.setName("My cow Elsie");
mySnake.setName("My snake Sammy");
System.out.print(myDog.getName() + " says ");
myDog.speak();
System.out.print(myCow.getName() + " says ");
myCow.speak();
System.out.print(mySnake.getName() + " says ");
mySnake.speak();
```

```
}
}
```

Question 5: [30]

Java displays an Exception message when the program code could have prevented an error.

Using scanner

Create an exception handling method that declares three integers, prompts the user for values for two of them, and calculates the value of the third integer by dividing the first two values. (hint: Elephant's and Aliens)

```java
package exception;

import java.util.Scanner;

/**
 *
 * @author Thandanani.Dube
 */
public class Exception {


    public static void main(String[] args) {




    {
    Scanner input = new Scanner(System.in);
    int numerator, denominator, result;
    System.out.print("Enter numerator >> ");
    numerator = input.nextInt();
    System.out.print("Enter denominator >> ");
    denominator = input.nextInt();
```

```java
result = numerator / denominator;
System.out.println(numerator + " / " + denominator + " = " + result);
/*
numerator: the term of a fraction, usually above the line, that indicates the number of equal parts
that are to be added together; the dividend placed over a divisor:
The numerator of the fraction 7/5 is 7.
*/


/*
denominates:  that term of a fraction, usually written
under the line, that indicates the number of equal parts into which the unit is divided;
divisor
*/
}
}


    }
```

TOTAL MARKS: 100