FINAL EXAM
FIRST SEMESTER SESSION 2011/2012

COURSE CODE / NAME: STIA1013 INTRODUCTION TO PROGRAMMING
DATE: 08 JANUARY 2012 (SUNDAY)
TIME: 2.30 - 5.00 P.M. (2½ HOURS)
VENUE: DSB K.TM, DSB K.T/WD, KTB

INSTRUCTION:

1. This book script contains THREE (3) sections in FOURTEEN (14) printed pages excluding the cover page.
2. Answer ALL QUESTIONS in the spaces provided.
3. You are NOT ALLOWED to remove the exam paper from the examination hall.

MATRIC NO: ____________________________   (with number)

( with word)

IDENTIFICATION CARD NO.: ____________________________

LECTURER: ____________________________

GROUP: □ TABLE NO.: □

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CONFIDENTIAL
SECTION A: MULTIPLE CHOICE QUESTIONS (10 MARKS)
Please circle the correct answer.

1. Which of the following is NOT high-level programming language?
   a) Java
   b) Visual Basic
   c) C++
   d) Assembly

2. Which is the principle of object-oriented programming that hides the implementation from outsiders?
   a) Abstraction
   b) Encapsulation
   c) Polymorphism
   d) Inheritance

3. Which one of the following statements is TRUE about a Java compiler?
   a) It translates the object code into the source code.
   b) It translates the library code into the virtual machine code.
   c) It translates the source code into the virtual machine code.
   d) It translates the virtual machine code into the source code.

4. Which of the following data types can be assigned to integer value?
   I. float
   II. byte
   III. long
   IV. short
   a) II and IV only
   b) III and IV only
   c) I, II and III only
   d) II, III and IV only

5. What is the output of the following code?

```java
public class PrintIt
{
    public static void main(String[] args)
    {
        System.out.println(1+1+"4"+1+1);
    }
}
```

   a) 242
   b) 2411
   c) 1142
   d) 1+1+"4"+1+1
6. _______ is the code with natural language mixed with Java code.
   a) Java program
   b) A Java statement
   c) Pseudocode
   d) A flowchart diagram

7. Which of the following assignments is FALSE?
   a) There are two kinds of methods namely methods that return a value and void methods which do not return a value.
   b) A local variable is a variable declared within a method definition.
   c) Every method belongs to some class and is available to objects created from the class.
   d) A method body cannot contain an invocation of another method.

8. If the value of income is 4001, what is the output of the following code?

```java
if (income > 3000) {
    System.out.println("Income is greater than 3000");
} else if (income > 4000)
    System.out.println("Income is greater than 4000");
```

   a) Income is greater than 3000
   b) Income is greater than 3000
      Income is greater than 4000
   c) Income is greater than 4000
   d) Income is greater than 4000
      Income is greater than 3000

9. This array field holds the number of elements that the array has.
   a) size
   b) elements
   c) length
   d) width

10. What is the output of the following program?

```java
public class StringValue {
    public static void main(String args[]) {
        String s = "That was the breaking News";
        System.out.println(s.indexOf("break"));
    }
}
```

   a) 11
   b) 12
   c) 13
   d) 14
SECTION B: STRUCTURED QUESTIONS (60 MARKS)
Please answer in the space provided.

1. Give **FOUR (4)** components of computer.  
   (4 marks)

2. Based on the following incomplete program, you are required to produce a graphical representation of a class using Unified Modeling Language (UML).

```java
public class Staff
{
    private int staffNumber;
    private String staffName;
    private double salary;

    public Staff(int staffNo, String name, 
                 double salary)
    {
        // ...
    }

    public int getStaffNumber() { .... }
    public String getStaffName() { ...... }
    public void setSalary(double newSalary) { .... }
    public void setStaffName (String newName) { ... }
}
// end of class Staff
```

(4 marks)
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3. Describe briefly about the concept of 'Inheritance'. Give TWO (2) reasons why do we need inheritance in our program. (4 marks)

4. There are two types of Java programs. Give ONE (1) difference between applications and applets? (2 marks)

5. Write the following formula in Java language syntax.
   a) \[ \frac{b^2 - 4ac}{2a} \] (2 marks)
   b) \[ \frac{mx + cy}{a + b} \] (2 marks)
6. The following code consists of several syntax errors. Identify the error and circle it on the given code. (4 marks)

```java
import java.util.Scanner;
public class Test {
    public static void main(String[] args) {
        scanner keyboard = new scanner(System.in);
        int carryMark, finalExam, totalMark;
        String name;
        System.out.println("Please enter student name");
        name = keyboard.nextInt();
        System.out.println("Please enter the carry mark");
        carryMark = keyboard.nextInt();
        System.out.println("Please enter the final exam mark");
        finalExam = keyboard.nextInt();
        carryMark + finalExam = totalMark;
    }
}
```

7. Based on the following flowchart, complete the given Java program.
import java.util.Scanner;
public class WorkingHours
{
    public static void main(String [] args)
    {
        Scanner input = new Scanner(System.in);
        //Declare variables

        do{
            System.out.print("Enter Working Hours for day "+ day+":");
            //Input workingHours

            //Add totalHours with workingHours

            //Increment day by 1

        }while (day <= 5); //end do-while
        //Display totalHours
        System.out.println("Total Working Hours: " + totalHours);
    } //end main
} //end class
8. Complete the given program based on the given output.

What is the species' name? Alien
What is the species' population? 10000000
Name : Alien
Population : 10000000

(5 marks)

```java
import java.util.Scanner;

public class SpeciesFirstTry{
    public String name;

    public int __________;

    public void __________(){
        Scanner keyboard = new Scanner(System.in);
        System.out.print("What is the species' name? ");
        name = keyboard.nextLine();

        System.out.print("What is the species population? ");
        populations = keyboard.nextInt();
        writeOutput(name, populations);
    }

    public ______ writeOutput(String ____________,
                               int population)
    {
        System.out.print("Name : " + fullname);
        System.out.print("Population : " + population);
    }
}

public class SpeciesFirstTryDemo
{
    public static void main(String[] args)
    {
        SpeciesFirstTry ____________ = new SpeciesFirstTry();
        speciesOfTheMonth.readInput();
    }
}
9. Understand and analyze the problem below:

Employees at Kaya Kiosk earn the basic hourly wage of RM5.00. They will receive a commission on the sales they generate while tending the counter. The commission is based on the following formula:

<table>
<thead>
<tr>
<th>Sales Volume</th>
<th>Commission</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM150.00 to RM300.00</td>
<td>5% of total sale</td>
</tr>
<tr>
<td>RM301.00 to RM500.00</td>
<td>10% of total sale</td>
</tr>
<tr>
<td>Above RM500.00</td>
<td>15% of total sale</td>
</tr>
</tbody>
</table>

Based on above scenario, write a few lines of Java statements that can calculate the commission based on the sales volume. Assumed that variables `sale` and `commission` have been declared as double data type.

(6 marks)

10. Rewrite the following *for* loop into a *while* loop.

```java
int s=0;
for (int i=1; i<=10; i++) s=s+i;
System.out.println("s = " + s);
```

(5 marks)
11. Write a statement that declares a String array initialized with the following strings: "ilmu", "Budi" and "Bakti".  

\[2 \text{ marks}\]

12. An application uses a two-dimensional array declared as follows:

\[
\begin{array}{c}
\text{int [][] numbers = \{ \{1, 2, 3, 4\},} \\
\{5, 6, 7, 8\}, \\
\{9, 10, 11, 12\}\};
\end{array}
\]

Write java code that sums each row in the array and displays the results.  

\[5 \text{ marks}\]
13. What is the output of the following program?

```java
class IndexOfChar {
    public static void main(String args[]) {
        String s = "Honesty is the best Policy";
        System.out.println(s);
        System.out.println(s.indexOf('b', 1));
        System.out.println(s.indexOf('9', 1));
        System.out.println(s.substring(3));
    }
}
```

(4 marks)

14. What is the output of the following program?

```java
class lastIndexOfStrInd {
    public static void main(String args[]) {
        String s = "Java is a wonderful language";
        System.out.println(s);
        String t = s.substring(5, 15);
        System.out.println(s.substring(20));
        System.out.println(t);
        System.out.println("lastIndexOf\{f ul, 18\} = " + s.lastIndexOf("ful", 18));
    }
}
```

(4 marks)

15. What is the purpose of `charAt(int index)` in `String` method?

(2 marks)
SECTION C. CASE STUDY QUESTIONS (30 MARKS)
Please answer in the space provided.

1. You are appointed by your company to write a Java program to calculate the total cost should be paid by a customer based on the item(s) that they bought. The system will read the following data: the item to buy, price and quantity, and calculate the subtotal of the item. The system will loop until the user enter 'N' to stop the looping. Finally, the system will calculate the total cost that should be paid by a customer.

You are given two classes: mainPointOfSale and PointOfSale. Complete both classes based on the given information. The input and output of the system are as follows.

Enter item to buy (RM): SUGAR
Enter the price per unit (RM): 2.40
Enter the quantity to buy: 6
Sub Total(RM): 14.40

Any more input Yes/No (Y/N): Y

Enter item to buy (RM): MiLK
Enter the price per unit (RM): 2.15
Enter the quantity to buy: 5
Sub Total(RM): 10.75

Any more input Yes/No (Y/N): N

Total Price(RM): 25.15

Thank you for shopping with us

Note: The underline value must be entered by user.

(15 marks)

```java
import ____________________________;

public class PointOfSale
{

   public double processInput()
   {
      Scanner keyboard = new Scanner(System.in);

      int quantity;
      double price, subTotal, total;
      String item;

      System.out.print("Enter item to buy (RM) :");
```

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item = ________________;
System.out.print("Enter the price per unit (RM) : ");
price = ________________;
System.out.print("Enter the quantity to buy : ");
quantity = ________________;
subTotal = calculate(price,quantity);
return ________________;
}
public ______ calculate (double price,int quantity)
{
    return ________________ // write a formula;
}

import ________________;

public class mainPointOfSale
{
    public static void main(String[] args)
    {
        ________________ pos = new ________________ ;

        Scanner keyboard = new Scanner(System.in);
        boolean moreEntries = true;
        double subTotal,total;
        String answer;
        total = 0.0;

        while (__________)
        {
            subTotal = pos.processInput();
            System.out.printf("Sub Total(RM):%.2f\n\n", ________);
            total = ________________;
            System.out.print("Any more input Yes/No (Y/N): ");
            answer = ________________ ;
            if (answer.trim().equalsIgnoreCase("N"))
                moreEntries = ________________;

        }
}

12
System.out.println("\n\n");
}
System.out.println("Total Price(RM): ");
System.out.println("\n\n");
System.out.println("Thank you for shopping with us");
}

2. A painting company has determined that for every 100 square feet of wall space, one gallon of paint and four hours of labour will be required. The company charges RM18.00 for every gallon and RM15.00 per hour for labour. Complete the PaintDemo class below that consists of the main method and allows the user to enter the square feet of wall space in room. Then, complete the Paint class given that consists of two user-defined methods as follows:

a) calculateTotalCost() method, which computes the following items:
   • The number of gallons of paint required.
   • The hours of labour required.
   • The cost of the paint.
   • The labour charges.
   • The total cost of the paint job.

b) printOutput() method, which print the total square feet and cost of the paint job.

Your program should produce the following expected output:

Enter square feet of wall space: 300
Total square feet of wall is 300
Total cost for paint job is RM 234.00

Note: The underline value must be entered by user.

(15 marks)
import java.util.*;

public class PaintDemo {
    public static void main(String[] args) {

    }
}

public class Paint{