



**EASTERN UNIVERSITY, SRILANKA**  
**DEPARTMENT OF MATHEMATICS**  
**THIRD YEAR EXAMINATION IN SCIENCE-2012/2013**  
**SECOND SEMESTER ( SEPT. /OCT. ,2015)**  
**OC 306 - FUNDAMENTAL OF JAVA PROGRAMMING**  
**(PROPER & REPEAT)**

**Answer all questions**

**Time allowed: Two Hours**

Q1. A programming language is a language that can be used to communicate with a computer.

1. State the difference between Compiler and interpreter.
2. Describe the three types of errors that can be present in a java program.
3. Write down the basic structure of a java program using a simple example.
4. Briefly explain the difference between the if statement and switch statement with suitable example.
5. Give java statements that accomplish each of the following tasks:
  - a. Declare an integer variable **var**.
  - b. Prompt the user to enter an integer value.
  - c. Read an integer value from the user and store it in the variable **var**.
  - d. Display the variable and a message saying whether the number is positive, negative, or zero.
6. Find the output of the following java code fragment.

```
int a=6, b=22;  
  
System.out.print( b );  
  
System.out.print(--b + a);  
  
System.out.print(b--);  
  
System.out.print(++a + b);  
  
System.out.print(b % a);
```

Q2. The flow of control jumps from one part of the program to another, depending on calculations performed in the program.

1. Briefly explain the difference between the **while loop** and **do-while loop** with suitable example.
2. Convert the following code fragment into **for loop** and **do-while loop**.

```
int i=1;
while(i<5)
{
    System.out.println("The number is" + i);
    if(i==2)
        i++;
    else
        i=i+2;
}
```

3. Write java statements that uses **while loop** or **for loop** to perform the following steps:
  - a. Prompt the user to input two integers: **firstNum** and **secondNum** (**firstNum** must be less than **secondNum**),
  - b. Output all odd numbers between **firstNum** and **secondNum**,
  - c. Output the sum of all even numbers between **firstNum** and **secondNum**,
  - d. Output the numbers and their squares between **firstNum** and **secondNum**,
  - e. Output the sum of the square of the odd numbers between **firstNum** and **secondNum**.

4. Find the output of following code fragment:

```
for (int i=1 ; i<=6; i++)
{
    for( int j=1; j<= 5; j++)
    {
        System.out.print ('&');
    }
    System.out.println();
}
```

5. Write a java program to read 10 integer values from the user and do the following tasks:

(Hint: You have to create an array to store the 10 values)

- a. Find the summation,
- b. Find the average,
- c. Find the largest value,
- d. Find the smallest value.

Q3. Object-oriented programming is a method of implementation in which programs are organized as cooperative collections of objects.

1. State the difference between **Object** and **Class** with suitable example.

2. Briefly explain the fundamental principles of OOP.

3. Write a java program to do the following tasks:

a. Define a class **Publication** which has attributes **title** and **price**, functions: **getData()** and **print()**.

b. Derive the following sub classes from the **Publication** class:

i. A sub-class **Book** which has an attribute: **ISBN\_No** and functions: **getData()** and **print()**.

ii. A sub-class **Magazine** which has an attribute: **Volume\_No** and functions: **getData()** and **print()**.

iii. With the **Magazine** sub-class as base, derive another sub-class **Journal** which has an attribute: **JournalName** and Functions: **getData()** and **print()**.

iv. In **main ()** create an object for the class **Journal**. Invoke the **getData()** and **print()** functions for this object.

Constructor in java is a special type of method that is used to initialize the object.

1. List and briefly explain the Access Modifiers in java programming

2. Define the following terms related with variables:
  - a. Local variable,
  - b. Instance variable,
  - c. Class variable.
3. Briefly explain the difference between **default constructor** and **parameterized constructor**.
4. Illustrate the uses of **this** and **super** keywords with suitable example.
5. Discuss the difference between method **Overriding** and **Overloading** in java.