Introduction to Object Oriented Programming Through Java

DURATION: 03 Hours

MAXIMUM MARKS: 100

Instructions for Candidate:

- Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
- Question Paper is in English language. Candidate can answer in English language only.
- There are TWO PARTS in this Module/Paper. PART ONE contains FOUR questions and PART TWO contains FIVE questions.
- PART ONE is Objective type and carries 40 Marks. PART TWO is subjective type and carries 60 Marks.
- PART ONE is to be answered in the OMR ANSWER SHEET only, supplied with the question paper, as per the instructions contained therein. PART ONE is NOT to be answered in the answer book for PART TWO.
- Maximum time allotted for PART ONE is ONE HOUR. Answer book for PART TWO will be supplied at the table when the answer sheet for PART ONE is returned. However, candidates who complete PART ONE earlier than one hour, can collect the answer book for PART TWO immediately after handing over the answer sheet for PART ONE.
- Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his Answer sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question booklet is complete in all respect.
PART ONE  
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the “OMR” answer sheet supplied with the question paper, following instructions therein. (1x10)

1.1 Given that Item is a class, how many objects and how many reference variables are created by the following code?

    Item item, stuff;
    item = new Item();
    Item entity = new Item();

A) Three objects are created.  
B) One reference variable is created.  
C) Two reference variables are created.  
D) Three reference variables are created.

1.2 Which of the following is not legal example of identifier?

A) Bingo      B) all@hands
C) $$_100 $     D) mål

1.3 Which of the following is used refer the current object in situations where a local variable hides, or shadows, a field with the same name?

A) this      B) super
C) current     D) none of the above

1.4 Which one of the following class declarations is a valid declaration of a class that cannot be instantiated?

A) abstract class Ghost { void haunt(); }
B) abstract class Ghost { void haunt(); {} }
C) abstract Ghost { abstract void haunt(); }
D) static class Ghost { abstract haunt(); }

1.5 Which of the following exception is thrown when attempting integer division with zero, meaning that integer division by zero is an illegal operation?

A) ArithmeticException  
B) DividebyZeroException  
C) IllegalDivisionException  
D) UnsupportedException

1.6 What happens when you try to compile and run the following program?

    public class Prog1 {
        public static void main(String[] args) {
            int k = 1;
            int i = ++k + k++ + ++ k; // (1)
            System.out.println(i);
        }
    }

A) The program will compile and print the value 3, when run.  
B) The program will compile and print the value 4, when run.  
C) The program will compile and print the value 7, when run.  
D) The program will compile and print the value 8, when run.

1.7 What will be the result of attempting to compile and run the following class?

    public class IfTest {
        public static void main(String[] args) {
            if (true)
                if (false)
                    System.out.println("a");
            else
                System.out.println("b");
        }
    }

A) The code will fail to compile because the compiler will not be able to determine which if statement the else clause belongs to.  
B) The code will compile correctly and display the letter a, when run.  
C) The code will compile correctly and display the letter b, when run.  
D) The code will compile correctly, but will not display any output.

1.8 Which of the following keyword does not represent any type?

A) void      B) static
C) final     D) transient

1.9 The methods in a(n) _______ are all implicitly abstract and public by virtue of their definition.

A) interface     B) abstract class
C) class         D) package
1.10 What will be the result of compiling and running the following program?

```java
public class Polymorphism {
    public static void main(String[] args) {
        A ref1 = new C();
        B ref2 = (B) ref1;
        System.out.println(ref2.f());
    }
}
```

```java
class A {
    int f() { return 0; }
}
class B extends A {
    int f() { return 1; }
}
class C extends B {
    int f() { return 2; }
}
```

A) The program will compile but will throw a ClassCastException, when run.
B) The program will compile and print 0, when run.
C) The program will compile and print 1, when run.
D) The program will compile and print 2, when run.

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the “OMR” answer sheet supplied with the question paper, following instructions therein. (1x10)

2.1 An instance member is never a method.
2.2 Character literals ‘t’ and ‘u0009’ are equivalent.
2.3 A class declaration introduces a new reference type.
2.4 An abstract class must be complete, whereas a final class is considered incomplete.
2.5 Except for unary postfix increment and decrement operators, all unary operators, all assignment operators, and the ternary conditional operator associate from right to left.
2.6 The expression (1+2+"3") evaluates to the string "33".
2.7 The for( ) loop has its limitations that it does not provide any provision for positional access using an index.
2.8 The break statement comes only in the labeled form.
2.9 All exceptions are derived from the java.lang.Error class.
2.10 Overriding occurs when the method names are the same, but the parameter lists differ.
3. Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the “OMR” answer sheet supplied with the question paper, following instructions therein.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 A method is an operation defining the behaviour for a particular object</td>
<td>A. an object</td>
</tr>
<tr>
<td>3.2 A name in a program is called</td>
<td>B. a Boolean value</td>
</tr>
<tr>
<td>3.3 Nonstatic members belong to the objects of the class and are called</td>
<td>C. Static block</td>
</tr>
<tr>
<td>3.4 Static code is executed in the context of</td>
<td>D. an identifier</td>
</tr>
<tr>
<td>3.5 Certain operations have no mathematical result, and are represented by</td>
<td>E. types.</td>
</tr>
<tr>
<td>3.6 The &lt;loop condition&gt; must evaluate to</td>
<td>F. abstraction</td>
</tr>
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<td>3.7 The super() construct is used in a subclass constructor to invoke a constructor in</td>
<td>G. instance members</td>
</tr>
<tr>
<td>3.8 The keyword implements is used to specify that a class inherits from</td>
<td>H. NaN (Not a Number)</td>
</tr>
<tr>
<td>3.9 The binary instanceof operator can be used for comparing</td>
<td>I. the immediate superclass</td>
</tr>
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<td>3.10 The accessibility modifiers allowed for members in an enclosing type declaration can naturally be used for</td>
<td>J. an interface.</td>
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<td>K. Overloaded method</td>
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<td>L. Exception</td>
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<td></td>
<td>M. nested types</td>
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</tbody>
</table>

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Choose the most appropriate option, enter your choice in the “OMR” answer sheet supplied with the question paper, following instructions therein.

|----------|-------------|-------------|------------|-------------------|----------------|--------------|------------------|-------------|----------|----------------------|--------|-----------------------|

4.1 ________ numbers are specified with a 0 prefix.
4.2 A documentation comment is a special-purpose comment that is used by the ________ tool to generate HTML documentation for the program.
4.3 ________ is an object that is interested in being notified when a particular event takes place.
4.4 Each array object has a final field called ________, which specifies the array size.
4.5 Java programming environments usually map the fully qualified name of ________ to the underlying (hierarchical) file system.
4.6 ________ are methods whose implementation is not defined in Java but in another programming language, for example, C or C++.
4.7 The switch expression is evaluated first. If the value is ________, an unboxing conversion is performed.
4.8 ________ is typically thrown by the JVM when an attempt is made to use the null value as a reference value to refer to an object.
4.9 ________ is one of the fundamental mechanisms for code reuse in OOP.
4.10 A subclass cannot ________ fields of the superclass, but it can hide them.
PART TWO
(Answer any FOUR questions)

5.  
a) What is automatic type promotion? Explain widening conversion and narrowing conversion.

b) What is an Applet? Explain the life cycle methods of an Applet.

c) What is default constructor? Explain constructor overloading.

(5+5+5)

6.  
a) What is a literals? List the types of literals with examples.

b) Draw class model (diagram) for student information system. The classes should show their attributes, and their operations. Also show the relationships between classes.

c) Explain the accessibility Modifiers for class Members using suitable examples.

(3+6+6)

7.  
a) Explain Short-Circuit operators.

b) Explain six language constructs for transferring control in a program.

c) What is custom exception? Demonstrate custom exception using suitable program.

(4+6+5)

8.  
a) Explain InputStream and OutputStream.

b) What is layout manager? Explain the different layout managers.

c) Differentiate abstract class and interface.

(4+6+5)

9.  
a) What is thread synchronization? Explain using example.

b) Explain the anonymous inner class using suitable example.

c) Explain Object Oriented Programming (OOP) and its principles.

(6+4+5)

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