B2.51-R4: INTRODUCTION TO OBJECT ORIENTED PROGRAMMING THROUGH JAVA

अवधि: 03 घंटे **अधिकतम अंक: 100**

DURATION: 03 Hours **MAXIMUM MARKS: 100**

ओएमआर शीट सं.: **OMR Sheet No.:**						

रोल नं.: **Roll No.:** | | | | | | |

उत्तर-पुस्तिका सं.: **Answer Sheet No.:** | | | | | | |

परीक्षार्थी का नाम: **परीक्षार्थी के हस्ताक्षर**:

Name of Candidate: _____; Signature of candidate: _____

परीक्षार्थियों के लिए निर्देश:	**Instructions for Candidate:**
कृपया प्रश्न-पुस्तिका**,** ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यान पूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकता है।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** है। **भाग एक** में चार प्रश्न और **भाग दो** में पाँच प्रश्न है।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions**.**
भाग एक "वैकल्पिक" प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो**, "व्यक्तिपरक" प्रकार है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is subjective type and carries 60 Marks.
भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर-पुस्तिका** पर**,** उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने है। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**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**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	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.**
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना एवं अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हाल नहीं छोड़ सकता हैं। ऐसा नही करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**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.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात एवं उत्तर देने से पहले उम्मीदवार यह जाँच कर यह सुनिश्चित कर ले कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	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.

जब तक आपसे कहा न जाए तब तक प्रश्न-पुस्तिका न खोलें।

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

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

ROUGH WORK SPACE:

1.10 What will be the result of compiling and running the following program?

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

ROUGH WORK SPACE:

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. (1x10)

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

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. (1x10)

A.	Octal	**B.**	packages	**C.**	override
D.	javadoc	**E.**	Native methods	**F.**	Inheritance
G.	A listener	**H.**	a wrapper type	**I.**	CASE tool
J.	length	**K.**	Interoperability	**L.**	heap
M.	NullPointerException				

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.

ROUGH WORK SPACE:

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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ROUGH WORK SPACE:

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