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

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| 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 :
Name of Candidate : _____

परीक्षार्थी के हस्ताक्षर :
;Signature of Candidate : _____

## परीक्षार्थियों के लिए निर्देश :

## Instructions for Candidate :

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| कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक 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** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं। | 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 का 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 हैं। **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 पश्चात् 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** to the Invigilator. |
| परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं 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/her 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 पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है। | After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question Booklet is complete in all respect. |

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**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 Which one of these lists contains only Java programming language keywords?

(A) class, if, void, long, Int, continue

(B) goto, instanceof, native, finally, default, throws

(C) try, virtual, throw, final, volatile, transient

(D) printf, constant, super, implements, do

1.2 Which is the valid declarations within an interface definition?

(A) public double methoda();

(B) public final double methoda();

(C) static void methoda(double d1);

(D) protected void methoda(double d1);

1.3 Which is a valid declarations of a String?

(A) String s1 = null;

(B) String s2 = 'null';

(C) String s3 = (String) 'abc';

(D) String s4 = (String) '\ufeed';

1.4 What will be the output of the program?
```
public class TestDogs
{
   public static void main(String [] args)
{
   Dog [][] theDogs = new Dog[3][];

System.out.println(theDogs[2][0].toString());
 }
}
class Dog { }
```

(A) null
(B) theDogs
(C) Compilation fails
(D) An exception is thrown at runtime

1.5 What will be the output of the program ?
```
public class Test
{
 public static void main(String [] args)
{
      signed int x = 10;
for (int y=0; y<5; y++, x- -)
 System.out.print(x + ", ");
}
}
```

(A) 10, 9, 8, 7, 6,
(B) 9, 8, 7, 6, 5,
(C) Compilation fails.
(D) An exception is thrown at runtime.

1.6 Which is true about an anonymous inner class?
(A) It can extend exactly one class and implement exactly one interface.
(B) It can extend exactly one class and can implement multiple interfaces.
(C) It can extend exactly one class or implement exactly one interface.
(D) It can implement multiple interfaces regardless of whether it also extends a class.

**1.7** Which statement is true about a static nested class?

    (A) You must have a reference to an instance of the enclosing class in order to instantiate it.

    (B) It does not have access to nonstatic members of the enclosing class.

    (C) It's variables and methods must be static

    (D) It must extend the concrete class.

**1.8** Which interface provides the capability to store objects using a key-value pair?

    (A) Java.util.Map

    (B) Java.util.Set

    (C) Java.util.List

    (D) Java.util.collection

**1.9** Which cannot directly cause a thread to stop executing?

    (A) Calling the SetPriority() method on a Thread object.

    (B) Calling the wait() method on an object.

    (C) Calling notify() method on an object.

    (D) Calling read() method on an Input Stream object.

**1.10** Which will contain the body of the thread?

    (A) run();

    (B) start();

    (C) stop();

    (D) main();

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

**2.1** The modulus operator (%) in Java can be used only with variables of integer type.

**2.2** Declarations must appear at the start of the body of a Java method

**2.3** All bitwise operations are carried out with the same level of precedence in Java

**2.4** The operations y >> 3 and y >>> 3 produce the same result when y > 0.

**2.5** Consider the statement "x = (a > b) ? a:b"; then the value of x is 27, if a = 18 and b = 27.

**2.6** The expression (y >= z && a == b) is evaluated by first evaluating the expression y >= z, and then evaluating a == b

**2.7** The "switch" selection structure must end with the default case.

**2.8** An individual array element from an array of type int, when passed to a method is passed by value.

**2.9** Objects of a subclass can be assigned to a super class reference.

**2.10** Objects of a super class can always be assigned to a subclass reference.

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** | Contract between objects on how to communicate with each other | **A.** | Arrays |
| **3.2** | Classes can be derived from classes | **B.** | Encapsulation |
| **3.3** | Objects that store multiple variables of the same type | **C.** | Multi-thread |
| **3.4** | Ability of an object to take on many forms | **D.** | Generics |
| **3.5** | process of hiding the implementation details from the user | **E.** | Applet |
| **3.6** | Mechanism of wrapping the data & code acting on the data together as single unit | **F.** | Method |
| **3.7** | Java program that runs in a Web browser | **G.** | Polymorphism |
| **3.8** | Program contains two or more parts that can run concurrently | **H.** | Abstract class |
| **3.9** | Collection of statements that are grouped together to perform an operation | **I.** | Abstraction |
| **3.10** | The basic building block of a Java method | **J.** | Interface |
| | | **K.** | Collections |
| | | **L.** | Statement |
| | | **M.** | Inheritance |

4. **Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein.** (1x10)

| | | | | | |
|---|---|---|---|---|---|
| **A.** | Object | **B.** | Method | **C.** | Throwable |
| **D.** | Bit | **E.** | Processor | **F.** | Java |
| **G.** | Argument | **H.** | byte code | **I.** | Static, Protected |
| **J.** | Applet | **K.** | Compiler | **L.** | Encapsulation |
| **M.** | algorithm | | | | |

**4.1** The _____ is the part of a computer that follows instructions.

**4.2** A (n) _____ is a program that translates programs to a simpler language that the computer can execute.

**4.3** The Java Virtual Machine translates a Java program from _____ to machine language.

4.4 A (n) _____ is an action that a Java object can perform.

**4.5** Another term for _____ is information hiding.

**4.6** A (n) _____ is a set of instructions that tells the basic strategy for solving a problem.

**4.7** A (n) _____ is a program meant to be sent from one computer to another across the world-wide web.

**4.8** A (n) _____ is a piece of information passed to a method.

**4.9** A (n) _____ is a digit that can only have the value 1 or 0.

**4.10** A (n) _____ is part of a program that has data associated with it and can perform certain actions.

## PART TWO

### (Answer any FOUR questions)

5. (a) Write a Program to find whether entered character is a vowel, constant, number or a special character.

   (b) Write a program to Generate Random Number Using Math. Random Function in JAVA

   (c) What is the difference between static binding and dynamic binding? **(6+6+3)**

6. Write short note on the following :

   (a) Polymorphism

   (b) Inheritance

   (c) Difference between Overloading and Overriding

   (d) Encapsulation

   (e) Abstraction **(3x5)**

7. (a) Define Stream. Using input and output stream write a program to write and read a string "NIELIT NEW DELHI".

   (b) Describe java applet and applet life cycle. What are the differences between an applet and a stand alone Java application?

   (c) What is JDBC ? Explain the four JDBC Driver Class. **(5+5+5)**

8. (a) What is UML? Explain the building blocks of UML?

   (b) Draw use case diagram and activity for hospital management system. **(8+7)**

9. (a) Draw state transition diagram for library management system and write down different state and Transitions.

   (b) Explain in brief Sequence diagram, Collaboration diagram, Deployment diagram with example. **(6+9)**

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**SPACE FOR ROUGH WORK**