

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

अवधि : 03 घंटे

DURATION : 03 Hours

अधिकतम अंक : 100

MAXIMUM MARKS : 100

ओएमआर शीट सं. :  
OMR Sheet No. :

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रोल नं. :

Roll No. :

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उत्तर-पुस्तिका सं. :

Answer Sheet No. :

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परीक्षार्थी का नाम :

Name of Candidate :

परीक्षार्थी के हस्ताक्षर :

; Signature of Candidate :

परीक्षार्थियों के लिए निर्देश :	Instructions for Candidates :
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 अंग्रेजी भाषा में है। परीक्षार्थी उत्तर लिखने के लिए केवल अंग्रेजी भाषा का ही प्रयोग कर सकते हैं।	Question Paper is in English language. Candidate has to 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 हैं तथा भाग दो "व्यक्तिपरक" प्रकार का है और इसके कुल अंक 60 हैं।	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 यह जाँच कर 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.

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 Questions; each question carries ONE marks)**

**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 of the following language is purely object-oriented, i.e., neither imperative nor there is any blend of imperative programming language ?
- (A) C
  - (B) C++
  - (C) Java
  - (D) Objective-C
- 1.2** To declare immutable data field, Java uses the keyword :
- (A) immutable
  - (B) final
  - (C) const
  - (D) static
- 1.3** In the Java statement "obj.doMethod(arg1, arg2)", from the viewpoint of message passing, the doMethod is :
- (A) Message sender
  - (B) Message receiver
  - (C) Message selector
  - (D) Message arguments
- 1.4** Which of the following is dynamically-typed language ?
- (A) Java
  - (B) C++
  - (C) Pascal
  - (D) Smalltalk
- 1.5** The parent class of all classes in Java, by default, is a class named.
- (A) Parent
  - (B) Object
  - (C) General
  - (D) Class
- 1.6** Which of the following is a correct syntax to declare a character array in Java ?
- (A) `char[] c = new char[5];`
  - (B) `char[] c = new char(5);`
  - (C) `char[5] c = new char[];`
  - (D) `char[5] c = new char();`
- 1.7** If a certain Java method throws an exception, it is necessary to catch the exception while invoking the method, if :
- (A) The exception is an Error
  - (B) The exception is a Checked Exception
  - (C) The exception is an Unchecked Exception
  - (D) It is always necessary, irrespective of the type of thrown exception

- 1.8 In sequence diagram, the object that becomes active in the middle of the execution is termed as :
- (A) Transient object
  - (B) Passive object
  - (C) Active object
  - (D) None of the above
- 1.9 Which of the following is true about aggregation relation ?
- (A) Aggregation is transitive
  - (B) Aggregation is symmetric
  - (C) Both of the above
  - (D) None of the above
- 1.10 It is necessary to implement a separate class for the association class when :
- (A) The association is one-to-many
  - (B) The association is one-to-one
  - (C) The association is many-to-many
  - (D) It is always necessary to implement a separate class if an association class is in the class diagram
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 A package can be represented in Java as a group of multiple objects working together.
- 2.2 It is not always necessary to extend an abstract class in Java.
- 2.3 Java AWT components are lightweight components.
- 2.4 When an array is passed to a method in Java, it receives a reference of the array.
- 2.5 Variables with protected access modifier are accessible in child class, only if accessed via inheritance.
- 2.6 Object Input Stream converts Java objects into corresponding streams.
- 2.7 An inner class in Java cannot access data fields and methods of the surrounding object.
- 2.8 It is not necessary to catch Arithmetic Exception when it is thrown.
- 2.9 It is not possible to represent concurrent activities in an activity diagram.
- 2.10 It is possible to have generalization among use cases in use case diagram.

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	Compiler resolves method call binding during execution of a program.	A.	Java applet
3.2	A variable in Java is not visible to any other class except the class in which it is declared.	B.	ResultSet
3.3	A Java method that belongs to the class rather than to its object.	C.	Serialization
3.4	A Java program that can be embedded into an webpage.	D.	State Diagram
3.5	The keyword that is used to represent that a method is throwing an exception, in Java.	E.	Component Diagram
3.6	A process in Java, by which an object can be written to a byte stream.	F.	Dynamic method binding
3.7	The object returned by the invocation of executeQuery() method of a JDBC Statement object.	G.	Overlapping subclass
3.8	In class diagram, there exists objects that can take properties from more than one classes.	H.	Composition
3.9	In class diagram, an object A is composed of multiple objects, and the constituting objects do not exist outside the composed object A.	I.	private access modifier
3.10	The diagram that is used to represent temporal behavior of the objects.	J.	Static method binding
		K.	throw
		L.	Static method
		M.	throws

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.	extend	B.	JApplet	C.	include
D.	SQLException	E.	Method overloading	F.	JButton
G.	Swimlanes	H.	DriverManager	I.	java.util.regex
J.	Bytecode	K.	Method overriding	L.	Text
M.	Autoboxing				

- 4.1 The output after the compilation of a Java program is known as \_\_\_\_\_.
- 4.2 When multiple methods of same name are declared within a class, it is known as \_\_\_\_\_.
- 4.3 Automatic conversion of primitive types to the object of their corresponding wrapper class is known as \_\_\_\_\_.
- 4.4 A JDBC Connection can be obtained by invoking get Connection method of \_\_\_\_\_.
- 4.5 A heavyweight component in Java Swing is \_\_\_\_\_.
- 4.6 Java Regular Expression API is available in the package \_\_\_\_\_.
- 4.7 The execute Query() method of Statement interface in JDBC throws \_\_\_\_\_.
- 4.8 In Java, a Character Stream is useful while processing a \_\_\_\_\_ file.
- 4.9 When a use case is part of, and is mandatory to perform a base use case, this relationship is known as \_\_\_\_\_ relationship.
- 4.10 The diagram that visually distinguishes responsibilities among organizations in an activity diagram, is known as \_\_\_\_\_.

**PART TWO**

**(Answer ANY FOUR questions)**

5. (a) Demonstrate the four aspects of Object-oriented Programming and Design.
- (b) What is multiple inheritance ? What problems it may produce ? Demonstrate with suitable examples.
- (c) Describe three methods to remove the multiple inheritance from a design, with suitable examples.
- (d) Demonstrate the differences between generalization and aggregation.

**(4+3+6+2)**

6. (a) What is chained exception ? Write a brief note on chained exception with suitable examples in Java.
- (b) Demonstrate the role of layout management in creating User Interface using Java Swing, with demonstration and examples of any two layout managers.
- (c) Write a brief note on event handling with suitable examples, in Java AWT.

**(4+5+6)**

7. (a) Demonstrate the various components of an UML collaboration diagram, with suitable examples.
- (b) Write a brief note on Deployment Diagram, with suitable examples.
- (c) What is nested state diagram ? How does it improve over flat state diagram ?
- (d) Write a brief description on Component Diagram.

**(4+5+3+3)**

8. (a) What is Javadoc ? Write a brief note on Java Documentation Comments, and its syntax.
- (b) The Java2D API provides uniform rendering model via java.awt.Graphics2D class. Demonstrate the graphics and rendering features as provided by the Graphics2D class.
- (c) Demonstrate the differences between Java IO and Java NIO with suitable examples.
- (d) How will you include an applet in a HTML webpage ? Demonstrate with suitable example. **(5+4+3+3)**

9. Write short notes on each of the following :

- (a) AWT Focus Subsystem.
- (b) Java application packaging.
- (c) Sequence Diagram. **(5+5+5)**

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**SPACE FOR ROUGH WORK**

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