A10.1-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.:

रोल नं.:
Roll No.:

उत्तर-पुस्तिका सं.:
Answer Sheet No.:

परीक्षार्थी का नाम:
Name of Candidate: _____ ; **Signature of candidate:** _____

परीक्षार्थी के हस्ताक्षर:

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 कर 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 अथवा 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 or 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.

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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 of the following class is a superclass that declares the common features of GUI components in packages java.awt and javax.swing?
A) Component
B) Container
C) Panel
D) Frame

1.2 The essential characteristics of an object that distinguish it from all other kinds of objects and thus provide crisply defined conceptual boundaries, relative to the perspective of the viewer is called:
A) Encapsulation
B) Abstraction
C) Modularity
D) Hierarchy

1.3 Why an object is considered an external entity in object-oriented?
A) its attributes change during operation of the system
B) it has numerous attributes
C) it has no attributes relevant to the system
D) its attributes are invariant during operation of the system

1.4 Which of the following provides a convention for unique class names that helps to prevent class-name conflicts?
A) interface
B) abstract class
C) package
D) super class

1.5 Which command from the JDK should be used to execute the main() method of a class named SmallProg?
A) java SmallProg
B) javac SmallProg
C) java SmallProg.java
D) java SmallProg.class

1.6 Which of the following variable represents class wide information in which all objects of the class share the same piece of data?
A) static
B) instance
C) local variable
D) none of the above

1.7 The _____ method of an object is called implicitly, when the object is used of type String.
A) getHashCode()
B) toObject()
C) toString()
D) toReference()

1.8 Which of the following *for* loop declaration is invalid?
A) for (int i = 7; i <= 77; i += 7)
B) for (int i = 99; i >= 0; i / 11)
C) for (int i = 20; i >= 2; - -i)
D) for (int i = 2; i <= 20; i = 3 * i)

1.9 Which of the following package contains the classes and interfaces required to create and manipulate GUIs?
A) Java Applet Package
B) Java Abstract Window Toolkit Event Package
C) Java Abstract Window Toolkit Package
D) Java 2D Shapes Package

1.10 What will be the result of compiling and running the following program?
```
class Operator {
   public static void main(String[] args) {
      int count = 1;
      while (count <= 10) {
         System.out.println(count % 2 == 1 ?
         "****" : "++++++++");
         ++count;
      } // end while
   } // end main
} // end class
```
A) 5 times **** and 5 times ++++++++
B) 10 times ++++++++
C) 10 times ****
D) Will not print anything.

ROUGH WORK SPACE:

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   To test for a range of values in a switch statement, use a hyphen (–) between the start and end values of the range in a case label.

2.2   Arrays are objects, so they're considered reference types.

2.3   Method overriding is commonly used to create several methods with the same name that perform the same or similar tasks, but on different types or different numbers of arguments.

2.4   Once you declare any constructor in a class, existence of a default constructor remains in class.

2.5   The compiler produces a separate file with the .class extension for every compiled class.

2.6   The compiler uses a special object called a class finder to locate the classes it needs.

2.7   Converting a primitive-type value to another primitive type retains the value if the new type is not a valid promotion.

2.8   Methods can return at most one value, but the returned value could be a reference to an object that contains many values.

2.9   Class Math is part of the java.lang package, which is implicitly imported by the compiler, so it's not necessary to import class Math to use its methods.

2.10   The continue statement, when executed in a while, for, do…while or switch, causes immediate exit from that statement.

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 reserved word cannot be used as	A.	Object- Oriented Design.
3.2	The formal parameter list is a comma-separated list of parameters for passing information to the method when the method is invoked by	B.	try block
3.3	Non-static nested classes are called inner classes and are frequently used to implement	C.	Static block
3.4	The method of design encompassing the process of object oriented decomposition and a notation for depicting both logical and physical and as well as static and dynamic models of the system under design is known as	D.	a method call
3.5	Static variables have	E.	a block.
3.6	You can have many catch blocks to handle different types of exceptions that might be thrown in the corresponding	F.	an identifier.
3.7	Placing a semicolon after the right parenthesis enclosing the parameter list of a method declaration is	G.	event handlers.
3.8	Sometimes a method performs a task that does not depend on the contents of any object is called	H.	class scope.
3.9	A set of statements contained within a pair of parentheses is called	I.	a syntax error.
3.10	When each object of a class maintains its own copy of an attribute, the field that represents the attribute is also known as	J.	static method.
		K.	Overloaded method
		L.	Exception
		M.	an instance variable

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.	JOptionPane	B.	Object	C.	Reference-type
D.	Aggregation	E.	This	F.	increment operator
G.	Overloaded	H.	Command-line arguments	I.	CASE tool
J.	Final	K.	Modularize	L.	heap
M.	Int				

4.1   Java's _____ class (package javax.swing) provides prebuilt dialog boxes for both input and output.

4.2   Single inheritance, multiple inheritance, and _____ comes under Hierarchy.

4.3   _____ constructors enable objects of a class to be initialized in different ways.

4.4   If an instance variable should not be modified, declare it to be _____ to prevent modification.

4.5   Every class in Java has the methods of class _____ (package java.lang), one of which is the finalize method.

4.6   When a non-static method is called for a particular object, the method's body implicitly uses keyword _____ to refer to the object's instance variables and other methods.

4.7   _____ are stored in an array of String.

4.8   Methods (called functions or procedures in some languages) help you _____ a program by separating its tasks into self-contained units.

4.9   If the _____ is to a variable, first the variable is incremented by 1, then its new value is used in the expression.

4.10   _____ instance variables are initialized by default to the value null.

ROUGH WORK SPACE:

PART TWO
(Answer any FOUR questions)

5.

a) What is Lifetime of *Variables*? Explain with example.

b) What advantage do Java's *layout managers* provide over traditional windowing systems? What are the problems faced by Java programmers who don't use layout managers?

c) *Constructor* declarations are very much like method declarations. List the constraints which are applied on constructor compared to methods. Write the example of constructor overloading.

(5+5+5)

6.

a) What is an *identifier*? List the examples of identifier.

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

c) A *class declaration* introduces a new reference type. Write the general syntax of class declaration.

(3+6+6)

7.

a) Write a short note on *method overriding*.

b) What are an *abstract* method, a *static* method and a *protected* method?

c) What is an *Exception* Propagation? Differentiate checked and unchecked exception.

(4+6+5)

8.

a) What is *aggregation*? Explain how java supports it.

b) How the *object oriented approach* helps us keep complexity of software development under control? What is *polymorphism*?

c) How are *this* and *super* used with constructor? How is it possible for two *String objects* with identical values not to be equal under the = = operator?

(4+6+5)

9.

a) Write a java program to demonstrate how to solve the *producer consumer problem* using thread.

b) Explain the various types of *classes* using suitable example.

c) What is *Object Oriented Programming* (OOP)? Describe the principles of OOP. Explain the *Encapsulation* principle.

(7+4+4)

ROUGH WORK SPACE: