OBJECT ORIENTED PROGRAMMING WITH JAVA
(MCAP 1101)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Which statement is true about Java?
(a) Java is a sequence-dependent programming language
(b) Java is a code dependent programming language
(c) Java is a platform-dependent programming language
(d) Java is a platform-independent programming language.

(ii) Which one of the following is not a Java feature?
(a) Object-oriented (b) Use of pointers
(c) Portable (d) Dynamic and Extensible.

(iii) Which of the following is true about the anonymous inner class?
(a) It has only methods (b) Objects can't be created
(c) It has a fixed class name (d) It has no class name.

(iv) Which of the following is a reserved keyword in Java?
(a) object (b) strictfp (c) main (d) system.

(v) In java, jar stands for_____.
(a) Java Archive Runner (b) Java Application Resource
(c) Java Application Runner (d) None of these.

(vi) Which of the following is a mutable class in java?
(a) java.lang.String (b) java.lang.Byte
(c) java.lang.Short (d) java.lang.StringBuilder

(vii) Which of these classes are the direct subclasses of the **Throwable** class?
(a) RuntimeException and Error class
(b) Exception and VirtualMachineError class
(c) Error and Exception class
(d) IOException and VirtualMachineError class

(viii) Which of the given methods are of Object class?
(a) notify(), wait(long msecs), and synchronized()
(b) wait(long msecs), interrupt(), and notifyAll()
(c) notify(), notifyAll(), and wait()
(d) sleep(long msecs), wait(), and notify()

(ix) What will be the output of the following Java code?

```
class increment {
    public static void main(String args[])
    {
        int g = 3;
        System.out.print(++g * 8);
    }
}
```

(a) 32 (b) 33 (c) 24 (d) 25.

(x) The \u0021 article referred to as a
(a) Unicode escape sequence (b) Octal escape
(c) Hexadecimal (d) Line feed.

Group- B

2. (a) Define aggregation? How is aggregation different from association and generalization? [(CO1)(Recall/LOCQ)]
(b) What is the role of the Java interpreter? What purpose does the Just-in-Time-Compiler serve? [(CO2) (Memorize/LOCQ)]
(c) Explain with an example of the automatic type conversion in expression in Java. [(CO2) (Reproduce/LOCQ)]

4 + 4 + 4 = 12

3. (a) Write a program to accept a number from the user and calculate the reverse of the number and print. [(CO2) (Understand /LOCQ)]
(b) Discuss the difference between '= =' operator and equals( ) method in the context of string object. [(CO2) (Discuss/LOCQ)]
(c) Is 'sizeof' a keyword in Java? [(CO2) (Explain/LOCQ)]

6 + 4 + 2 = 12

Group - C

4. (a) Illustrate the concept of method overloading? How is a call to an overloaded method resolved? Give an Example. [(CO3) (Illustrate/IOCQ)]
(b) Write a class called Distance that represents a single distance in both miles and kilometers. (1 mile=1.609 kilometers). Provide suitable get( ), set( ) and display ( ) methods. Write a driver program. [(CO3) (Apply/IOCQ)]
(c) Write the use of 'this' keyword? [(CO3) (Write/IOCQ)]

6 + 4 + 2 = 12

5. (a) What happens when a sub-class object is assigned to a super class object reference? Explain with an example. [(CO3)(Demonstrate/IOCQ)]
   (b) How can a programmer define a class that cannot be inherited? Give an example. [(CO3) (Apply/IOCQ)]
   (c) Illustrate the usage of container class. [(CO3)(Illustrate/IOCQ)]

5 + 4 + 3 = 12

Group - D

6. (a) How do we design a package? How do we add a class or an interface to a package? [(CO4) (Examine/IOCQ)]
   (b) Create three interfaces, each with two methods. Inherit a new interface from the three, adding a new method. Create a class by implementing the new interface and also inheriting from a concrete class. Now write four methods, each of which takes one of the four interfaces as an argument. In main( ), create an object of your class and pass it to each of the methods. [(CO4) (Appraise/IOCQ)]
   (c) What are the similarities and dissimilarities between an abstract class and interface? [(CO4)(Differentiate/IOCQ)]

4 + 6 + 2 = 12

7. (a) Construct a class that keeps a running total of all characters passed to it (one at a time) and throws an exception if it is passed a non-alphabetic character. [(CO5) (Create/HOCQ)]
   (b) What is a finally block? When and how is it used? Give a suitable example. [(CO5) (Evaluate/HOCQ)]

6 + 6 = 12

Group - E

8. (a) Which thread is sure to run in Java program? Explain. [(CO6) (Write/HOCQ)]
   (b) Write multithreaded program that continuously prints the strings “ping” and “PONG” in the console at random distances at intervals of one second. Use two threads one for “ping” and another for “PONG”. [(CO6) (Create/HOCQ)]
   (c) Write the importance of thread priority? How do we set priorities for threads? [(CO6)(Write/HOCQ)]

4 + 6 + 2 = 12

9. (a) What are wrapper classes? Why are they used? How can they be used to convert a data of primitive type to object type? [(CO6) (Write/HOCQ)]
   (b) What happens if no delimiter is specified in the StringTokenizer constructor? [(CO6) (Appraise/HOCQ)]
   (c) Which exception is thrown, if you try to call clone( ) on a class that does not implement Cloneable interface? [(CO6) (Write/HOCQ)]

4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	25%	37.5%	37.5%

Course Outcome (CO):

CO1. Recall the basic concepts of object oriented programming.
CO2. Understand the Java language features and programming constructs
CO3. Demonstrate the concepts of classes, objects, constructors, method overloading, access control, inheritance and polymorphism
CO4. Examine the use of packages and interface.
CO5. Evaluate the application of exception handling in real life problem solving
CO6. Create multithreaded Java applications using of collection framework

*LOCQ: Lower Order Cognitive Question; IOCQ: Intermediate Order Cognitive Question; HOCQ: Higher Order Cognitive Question

Department & Section	**Submission Link**
MCA	https://classroom.google.com/c/NDQ2MTcyOTgxMDY3/a/NDY0NDk4OTYwNjkx/details