OBJECT ORIENTED PROGRAMMING WITH JAVA
(MCAP 2101)

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)   Before closing the stream and after reaching the end of stream marker, a
          program tries to read the stream again.
          (a) _error   (b) _checked exception
          (c) _compile error   (d) _no exception.

    (ii) double x=0;
          x = (check( ).equals("1")) ? getSales( ) : nextStore( );
          What data type could be returned by method check( ) as shown above?
          (a) int   (b) boolean
          (c) String   (d) Object.

    (iii) What will be the output of the following code segment?
          short tri[ ][ ] = new short[10][ ];
          for(int i = 0,count =0 ; i < tri.length; i++) {
            tri[i]= new short[i+1];
            for(int j = 0 ; j < tri[i].length; j++) {
              tri[i][j]= (short) count++;
            }
          }
          (a) tri[3][3]   (b) tri[4][4]
          (c) tri[5][3]   (d) tri[6][2].

    (iv) What parameters could be passed on the command-line so that the output of the
          program above is "6"?
          (a) 1 2 3 4   (b) 6 5 1
          (c) 6   (d) None.

(v) What will be the output of the following code segment?
String s1 = new String("AbraCadabra");
String s2 = new String(" willow woo");
String s3;
s3=s1.substring(1,5) + s2.toUpperCase().trim().substring(1,5);
Referring to the above, what is in s3 after execution?
(a) braCaWILLO   (b) braCILLO
(c) braCWILL   (d) braCaILLOW.

(vi) XXX = new Integer("155").toString();
What datatype or class is XXX in the above code segment?
(a) byte   (b) char[ ]
(c) StringBuffer   (d) String.

(vii) What will be the output of the following code segment (assuming that the object 'ct' gets stored in the address location 2345)?
```
class ClassTest{
        public String toString( ){
                return "ClassTest";
}
public static void main(String [ ] args){
        ClassTest ct = new ClassTest( );
        System.out.println(ct);
}
        }
```
(a) ClassTest@2345   (b) Error
(c) ClassTest   (d) ct.

(viii) Local variables in Java are stored in
(a) Heap   (b) Native Area
(c) Method Area   (d) Stack.

(ix) A monitor called "m" has two threads waiting with the same priority. One of the threads is "thread3". How can you inform "thread3" so that it alone moves from the Waiting state to the Ready state?
(a) thread3.notify( )   (b) m.notify(thread3)
(c) thread3.start( )   (d) notify(thread3).

(x) To access runtime type information for a class, array, or primitive datatype, you can use which one of the following classes?
(a) Runtime   (b) System
(c) Object   (d) Class.

Group – B

2. (a) Describe the mechanism of compilation and interpretation of Java source code with the help of a diagram.

(b)   What are bytecodes? How do you define the term machine code? How are bytecodes different from native codes?

(c)   What are the bitwise operators in Java? Explain the function of the shift operator.

4 + 4 + 4 = 12

3. (a)   What is a variable? What do you mean by dynamic initialization of variables? What is scope of a variable?

(b)   Describe the steps in creating an array in Java.

(5 + 3) + 4 = 12

Group – C

4. (a)   What are static inner class and anonymous class. Illustrate with an example. What is a singleton class?

(b)   Create a class with a private field and a private method. Create an inner class with a method that modifies the outer class field and calls the outer class method. In a second outer class method, create an object of the inner class and call it's method, then show the effect on the outer class object.

5 + 7 = 12

5. (a)   Create a general class ThreeDObject and derive the classes Box, Cube, Cylinder and Cone from it. The class ThreeDObject has methods wholeSurfaceArea ( ) and volume ( ). Override these two methods in each of the derived classes to calculate the volume   and whole surface area of each type of three-dimensional objects. The dimensions of the objects are to be taken from the users and passed through the respective constructors of each derived class. Write a main method to test these classes.

(b)   Explain how does Java implements runtime polymorphism?

(c)   What is the difference between shadow and override?

6 + 3 + 3 = 12

Group – D

6. (a)   Prove that the fields in an interface are implicitly static and final and all the methods in an interface are automatically public.

(b)   Give an example where interface can be used to support multiple inheritances. Develop a Java program for the example.

(c)   Can there be a try block without a matching catch block? Can there be a catch block without a matching try block?

4 + 4 + 4 = 12

7. (a) Create a package containing classes that define all input / output methods. Use this package for input / output operations in all the subsequent programs.

 (b) Which keywords are used in Java to handle exceptions? Explain how exception-handling mechanism can be used for debugging a program?

 (c) Differentiate between an error and an Exception in Java.

6 + 4 + 2 = 12

Group – E

8. (a) How do you start a thread? What happens if a thread is started with the run ( ) method?

 (b) "The main thread must be the last thread to finish execution. When the main thread stops, the program terminates." Is it true?

 (c) Create two Thread subclasses, one with a run( ) that starts up, captures the reference of the second Thread object and then calls wait( ). The other class' run( ) should call notifyAll( ) for the first thread after some number of seconds have passed, so the first thread can print a message.

4 + 3 + 5 = 12

9. (a) How does the Java garbage collector work? When is the finalize ( ) method invoked by the garbage collector?

 (b) What is object serialization in Java? Illustrate with an example.

 (c) What is the difference between a MenuItem and a CheckboxMenuItem?Which method of the Component class is used to set the position and size of a component?

(3 + 2) + 2 + (3 + 2) = 12

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MCA	https://classroom.google.com/c/MTQzMTMzODE2OTY3/a/Mjc0NzUwNjI4N TM0/details