

**OBJECT ORIENTED PROGRAMMING**  
**(INFO 2202)**

**Time Allotted : 2½ hrs**

**Full Marks : 60**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 4 (four) from Group B to E, taking one from each group.*

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

**Group – A**

1. Answer any twelve:

**12 × 1 = 12**

*Choose the correct alternative for the following*

- (i) Which of the following can be declared as final in java?
  - (a) Class
  - (b) Method
  - (c) Variable
  - (d) All of the above.
- (ii) Each time we shift a value to the right using '>>' operator it –
  - (a) multiply the value by 4
  - (b) multiply the value by 2
  - (c) divide the value by 4
  - (d) divide the value by 2
- (iii) Which class is treated as the default super class in Java?
  - (a) Java
  - (b) Super
  - (c) Class
  - (d) Object.
- (iv) `int i =2;`  
`System.out.println ("Welcome "+i+1);`  
What will be the Output of this code snippet?
  - (a) Welcome 3
  - (b) Welcome 21
  - (c) Compiler error
  - (d) None of the above.
- (v) Which class cannot be instantiated?
  - (a) Abstract
  - (b) Public
  - (c) Final
  - (d) Protected.
- (vi) Pack1 additionally includes files A.class and B.class where Pack2 includes files C.class and D.class. To import D.class in a Java code present outside Pack1, which of the following code is needed to be included?
  - (a) `import Pack1.*;`
  - (b) `import Pack1.Pack2.*;`
  - (c) `import Pack2.*;`
  - (d) any of above.
- (vii) Which keyword in java is used for exception handling?
  - (a) caught
  - (b) final
  - (c) throw
  - (d) All of these.
- (viii) Determine the output of this pseudocode:  
`TRY PRINT "Start"`  
`THROW NEW EXCEPTION "Failed"`  
`CATCH EXCEPTION PRINT "Caught"`  
`END TRY`  
`PRINT "End"`
  - (a) Start Failed
  - (b) Caught
  - (c) Start Caught
  - (d) Start Caught End

- (ix) Method used to take a string as input in Java?  
 (a) next()  
 (b) nextLine()  
 (c) Both A. and B.  
 (d) None of these
- (x) What is the output of the Java code with exceptions?  

```
public class ExceptionTest{
    public static void main(String[] args) {
        System.out.println("I am going to forest.");
        throw new ClassNotFoundException();
    }
}
```

 (a) I am going to forest.  
 (b) No output  
 (c) Compiler error  
 (d) None of the above

*Fill in the blanks with the correct word*

- (xi) JDK stands for \_\_\_\_\_.
- (xii) The outcome of (int)(7.9f) will be \_\_\_\_\_.
- (xiii) The Super Class of Exception is \_\_\_\_\_.
- (xiv) \_\_\_\_\_ are called the class variables.
- (xv) The catch block should always be accompanied by a \_\_\_\_\_ block.

### Group - B

2. (a) "Java is purely object oriented programming language" - Justify the acceptability of this statement. [[CO1](Evaluate/HOCQ)]  
 (b) With proper code example explain the relationship between aggregation, association and composition. [[CO1](Analyse/IOCQ)]  
**3 + 9 = 12**
3. (a) What is garbage and what is garbage collector in Java? Can we manually execute garbage collector as per our requirement? If yes, how? [[CO1](Understand/LOCQ)]  
 (b) Write a Java class Stack to implement the idea of a stack. This class should include the following properties (All variables are preferably declared private and methods public):  
 (i) int top --> stores the stack top  
 (ii) int arr[] --> stores the elements of the stack  
 (iii) Stack() --> consider stack will contain 5 elements  
 (iv) Stack(int) --> initiate the stack with the given number of elements  
 (v) push(int) --> push the element onto the stack; it returns the status of job completion.  
 (vi) pop() --> pops the element from the stack and print; it returns the status of job completion.  
 (vii) print() --> Displays the present content of the stack. [[CO1,CO2](Applyr/IOCQ)]  
**(2 + 2 + 2) + 6 = 12**

### Group - C

4. (a) What are the different ways to implement polymorphism in Java? Explain them with code example. [[CO3](Understand/LOCQ)]  
 (b) "Java does not support multiple inheritance" – Justify this statement. [[CO3](Evaluate/HOCQ)]  
**9 + 3 = 12**
5. (a) Explain the relationship between final, finalize and finally in Java with clear code examples. [[CO2](Analyse/IOCQ)]  
 (b) What is the major difference between String and StringBuffer. [[CO2](Understand/LOCQ)]  
 (c) String st="Hello"; st="World"; Considering the given code do you think String is still immutable? Justify your answer. [[CO2](Evaluate/HOCQ)]  
**6 + 3 + 3 = 12**

### Group – D

6. (a) Explain the difference between throw and throws in Java. Explain with code examples. [[CO4](Analyse/IOCQ)]  
 (b) Design a user defined exception to handle e-mail format error. (If the inputted email-id is not according to a predefined format <string>.gmail.com). Write the main function in separate driver class to demonstrate the behaviour of this exception. [[CO4](Apply/IOCQ)]  
**6 + 6 = 12**

```
7. Consider the following code:
class Test{
    public static void main(String ar[]){
        int b;
        try{
            b=5/Integer.parseInt(ar[0]);
            System.out.println("Result="+b);
        }
        catch(ArithmeticException e){
            System.out.println("Division by 0");
        }
        catch(ArrayIndexOutOfBoundsException e){
            System.out.println("Improper argument!");
        }
        catch(NumberFormatException e){
            System.out.println("Numeric input required!");
        }
        finally{
            System.out.println("From Finally");
        }
        System.out.println("Good Bye");
    }
}
```

What will be the output of this code if it is executed with the following command lines: (Explain your answers)

- (i) java Test 0
- (ii) java Test ab
- (iii) java Test
- (iv) java Test 2.

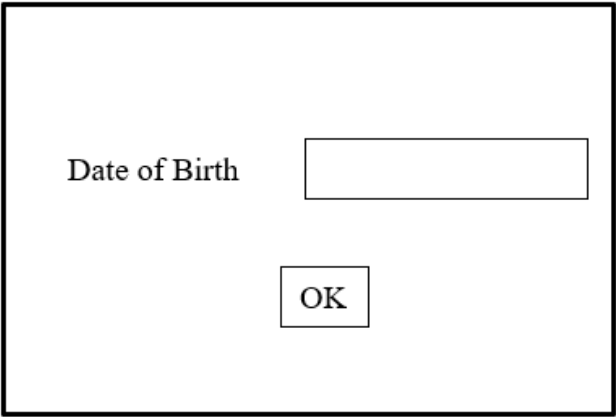
[[CO4)(Analyse/IOCQ)]  
**(4 × 3) = 12**

**Group - E**

- 8. (a) Write a Java program to count the number of words and lines present in a text file whose name is inputted by the user through command line.  
(b) What are the default streams of Java? Explain each of them and state in which stream category they belong.
- 9. (a) Differentiate between Applet and Swing.  
(b) Write a swing code which accepts date of birth from the user. Clicking on the “OK” button welcomes the user through welcome message box if the date is entered in dd/mm/yyyy format; otherwise displays error message in message box. The sub-window will be like Fig. 1.

[[CO5)(Analyse/HOCQ)]  
[[CO5)(Remember/LOCQ)]  
**6 + 6 = 12**

[[CO6)(Understand/LOCQ)]



**Fig. 1**

[[CO6) (Apply/IOCQ)]  
**5 + 7 = 12**

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	30.21	54.17	15.62

**Course Outcome (CO):**

- After successfully completing this course, the students will be able to:
- 1. Understand the basic concepts and fundamentals of platform independent object-oriented programming language and its specialties.
  - 2. Use the syntax and semantics of Java programming language and basic concepts of OOP to write programs relating to the real world in an Object-Oriented paradigm.
  - 3. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.
  - 4. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.
  - 5. Apply the knowledge of Input Output System handling to write user interactive programs.
  - 6. Design event driven GUI and applets which mimic the real-world scenarios.

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

