

GUJARAT TECHNOLOGICAL UNIVERSITY
BE-4 SEMESTER – OLD PAPER – S22 TO W25 – QUESTION BANK

Subject Name & Code:
Object Oriented Programming - I (3140705)

Unit 1: Introduction to Java and Elementary Programming

Repeated Questions:

1. **What is Java bytecode? What is the extension of a Java bytecode file? Which software is needed to run it?**
 - Appeared in: S23 (Q1a, 03 marks)
2. **List out features of Java. Explain any two.**
 - Appeared in: S22 (Q1a, 07 marks)
3. **Why Java supports platform independency? What is the role of JVM?**
 - Appeared in: W23 (Q1a, 03 marks)

Other Important Questions:

1. **Explain the significance of bytecode.**
 - Appeared in: W22 (Q1a, 03 marks)
 2. **Answer in one word:**
 - (i) Which integral type in Java has the exact range from -2147483648 to 2147483647?
 - (ii) The software for developing and running Java programs.
 - (iii) It is similar to machine instructions but is architecture neutral and runs on any JVM.
 - Appeared in: S24 (Q1a, 03 marks)
 3. **Write a single program demonstrating the use of: import, new, this, break, continue. Show how to compile and run.**
 - Appeared in: S22 (Q1b, 07 marks)
 4. **Write a program that reads an integer and adds all its digits. Example: 932 → 14.**
 - Appeared in: S24 (Q1b, 04 marks)
 5. **Write a program to display first n prime numbers, where n is a command line argument.**
 - Appeared in: W23 (Q1b, 04 marks)
 6. **Write a program declaring an integer array of 10 elements, and define methods: add(), max(), search().**
 - Appeared in: W23 (Q1c, 07 marks)
 7. **Analyze the given code snippets and write output/error (no justification needed).**
 - Appeared in: S24 (Q1c, 07 marks)
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Unit 2: Selections, Mathematical Functions, and Loops

Repeated Questions:

1. **Differentiate between while and do-while loop.**
 - Appeared in: S23 (Q1c-II, 02 marks)
2. **Explain syntax errors, runtime errors, and logic errors with examples.**
 - Appeared in: S23 (Q1b, 04 marks)

Other Important Questions:

1. **How many times is the println statement executed?**

java

```
for (int i = 0; i < 10; i++)
```

```
    for (int j = 0; j < i; j++)
```

```
        System.out.println(i * j);
```

- Appeared in: S23 (Q1c-III, 02 marks)
2. **If x = 1, what is returned by $x \% 2 == 0$?**
 - Appeared in: S23 (Q1c-IV, 01 mark)
 3. **List different types of loops in Java with code snippets.**
 - Appeared in: W24 (Q1b, 04 marks)
 4. **Write a program to check if a given number is a palindrome.**
 - Appeared in: W23 (Q4a, 03 marks)
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Unit 3: Methods and Arrays

Repeated Questions:

1. **What is method overloading? Explain with example.**
 - Appeared in: S24 (Q3a, 03 marks)
2. **Differentiate between arguments and parameters of a function.**
 - Appeared in: S22 (Q3b-i, 03 marks)
3. **Differentiate between pass by value and pass by reference.**
 - Appeared in: S22 (Q3b-ii, 03 marks)

Other Important Questions:

1. **Write a method that returns a new array by eliminating duplicate values.**
 - Appeared in: W25 (Q1c, 07 marks)
 2. **Write a program to copy one ArrayList into another.**
 - Appeared in: W24 (Q4a, 03 marks)
 3. **Declare an integer array of 10 elements, define methods: add(), max(), search().**
 - Appeared in: W23 (Q1c, 07 marks)
 4. **Implement a method search(String s) and sort() for an array of strings.**
 - Appeared in: W23 (Q3c, 07 marks)
 5. **Write a program to store district names in an array and handle out-of-bounds index.**
 - Appeared in: W23 (Q3b, 04 marks)
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Unit 4: Objects and Classes

Repeated Questions:

1. **Define class and object in Java with an example.**
 - Appeared in: S25 (Q1c, 07 marks)
2. **Explain the relationship between an object and its defining class.**
 - Appeared in: S24 (Q2a, 03 marks), W23 (Q2a, 03 marks)
3. **What is a constructor? Explain its features/characteristics.**
 - Appeared in: S25 (Q2a, 03 marks)

Other Important Questions:

1. **Justify:**
 - (i) Constructors should generally be public.
 - (ii) Why main is declared as static.
 - (iii) Why Java does not have destructors.
 - (iv) There are no pointers in Java.
 - Appeared in: S24 (Q2c, 07 marks)
 2. **Design a class Rectangle with fields length, width, default constructor, and getArea().**
 - Appeared in: W23 (Q2c, 07 marks)
 3. **Create a class Employee with id, name, monthly salary, constructor, getters/setters, and displayEmployee().**
 - Appeared in: S23 (Q2c, 07 marks)
 4. **Create a class Stopwatch with startTime, endTime, start(), stop(), and getElapsedTime().**
 - Appeared in: S23 (Q2c, 07 marks)
 5. **Create a class Account with Ac_No, Name, Balance, and methods display(), setData(), deposit().**
 - Appeared in: W24 (Q3c, 07 marks)
 6. **Create a class Counter with a parameterized constructor and a method to increment and return value.**
 - Appeared in: S24 (Q2b, 04 marks)
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Unit 5: Object-Oriented Thinking (Inheritance, Polymorphism, etc.)

Repeated Questions:

1. **Explain inheritance with example.**
 - Appeared in: S25 (Q3c, 07 marks)
2. **Explain polymorphism with example.**
 - Appeared in: S25 (Q3c, 07 marks)
3. **Differentiate between method overloading and method overriding.**
 - Appeared in: S25 (Q1a, 03 marks), W24 (Q2c, 07 marks)
4. **Explain super keyword and its use.**
 - Appeared in: S25 (Q3a, 03 marks), W24 (Q3a, 03 marks)
5. **Differentiate between abstract class and interface.**
 - Appeared in: S24 (Q2c-ii, 03 marks), W25 (Q1b-i, 02 marks)

Other Important Questions:

1. **What is dynamic binding?**
 - Appeared in: W25 (Q3a, 03 marks)
 2. **Explain the final keyword and its uses.**
 - Appeared in: S24 (Q3a, 03 marks), W24 (Q2a, 03 marks)
 3. **Explain this vs super keyword.**
 - Appeared in: S24 (Q2c-i, 03 marks)
 4. **Explain static, final, and super with examples.**
 - Appeared in: S22 (Q2a, 03 marks), S22 (Q3c, 07 marks)
 5. **What is the use of final, finally, and finalize?**
 - Appeared in: S25 (Q2c, 07 marks)
 6. **What is a final class? Why is it used?**
 - Appeared in: W22 (Q3a, 03 marks)
 7. **Explain the Object class and its methods.**
 - Appeared in: W24 (Q3b, 04 marks)
 8. **Analyze the given code and explain output/error related to inheritance and overriding.**
 - Appeared in: S24 (Q3b-i, 04 marks)
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Unit 6: Exception Handling, I/O, Abstract Classes, Interfaces

Repeated Questions:

1. **Differentiate between checked and unchecked exceptions.**
 - Appeared in: S23 (Q3a, 03 marks), W25 (Q3b-i, 02 marks)
2. **Explain throw and throws with examples.**
 - Appeared in: S23 (Q3b, 04 marks), W24 (Q4a, 03 marks)
3. **Explain finally and finalize.**
 - Appeared in: W24 (Q5a, 03 marks)
4. **Explain abstract class and interface with examples.**
 - Appeared in: W24 (Q4b, 04 marks)

Other Important Questions:

1. **Explain exception handling keywords with example.**
 - Appeared in: W25 (Q2c, 07 marks)
 2. **Demonstrate try-catch for ArithmeticException and InputMismatchException.**
 - Appeared in: S23 (Q3c, 07 marks)
 3. **Write a program to copy files using command-line arguments.**
 - Appeared in: W25 (Q3c, 07 marks)
 4. **Create a method Withdraw() that throws an exception if balance < withdrawal amount.**
 - Appeared in: W24 (Q4c, 07 marks)
 5. **Explain file I/O using byte stream (FileInputStream, FileOutputStream).**
 - Appeared in: S22 (Q3c, 07 marks)
 6. **Explain file I/O using character stream (FileReader, FileWriter).**
 - Appeared in: S22 (Q3c, 07 marks)
 7. **Explain BufferedReader and BufferedOutputStream with example.**
 - Appeared in: W22 (Q4c, 07 marks)
 8. **Write a program to read employee details from emp.txt and print them.**
 - Appeared in: W24 (Q5b, 04 marks)
 9. **Write a program to read student details from console and write to emp.txt.**
 - Appeared in: W24 (Q5b, 04 marks)
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Unit 7: JavaFX Basics, Event-Driven Programming, Animations

Repeated Questions:

1. **Explain the basic structure of a JavaFX program.**
 - Appeared in: S23 (Q5c, 07 marks)
2. **List JavaFX UI controls and explain any one.**
 - Appeared in: S23 (Q5b, 04 marks), W22 (Q4a, 03 marks)
3. **List layout panes in JavaFX.**
 - Appeared in: W22 (Q4a, 03 marks), S23 (Q5a, 03 marks)

Other Important Questions:

1. **Explain event source and event object. How to register an event handler?**
 - Appeared in: S23 (Q5c, 07 marks)
 2. **Write a program to demonstrate MouseEvents.**
 - Appeared in: S25 (Q4b, 04 marks)
 3. **Create a radio button using RadioButton class and ToggleGroup.**
 - Appeared in: S25 (Q5a, 03 marks)
 4. **Demonstrate animation using Animation, PathTransition.**
 - Appeared in: S25 (Q5a, 03 marks)
 5. **Explain how to create shapes in JavaFX.**
 - Appeared in: S25 (Q4b, 04 marks)
 6. **Write a program to create a login screen using GridPane.**
 - Appeared in: W25 (Q5c, 07 marks)
 7. **Write a program to handle key pressed, released, and typed events.**
 - Appeared in: W25 (Q5c, 07 marks)
 8. **Develop a GUI-based application using JavaFX controls.**
 - Appeared in: S22 (Q5c, 07 marks)
 9. **Write a program to create a student registration form using JavaFX.**
 - Appeared in: W24 (Q5c, 07 marks)
 10. **Design and develop an EMI Calculator using JavaFX.**
 - Appeared in: W23 (Q5c, 07 marks)
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Unit 8: JavaFX UI Controls and Multimedia

Repeated Questions:

1. **List any four UI controls in JavaFX.**
 - Appeared in: S24 (Q4b-i, 02 marks)
2. **List any two panes for containing and organizing nodes.**
 - Appeared in: S24 (Q4b-ii, 02 marks)

Other Important Questions:

1. **Explain** Label, Button, CheckBox, RadioButton, TextField, etc.
 - Covered in syllabus, not explicitly asked in papers but implied in GUI questions.
 2. **Write a program to demonstrate GUI application development using JavaFX.**
 - Appeared in: S24 (Q4c, 07 marks)
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Unit 9: Binary I/O, Recursion, Generics

Repeated Questions:

1. **Explain generics classes with example.**
 - Appeared in: S25 (Q4c, 07 marks)
2. **Explain generics methods with example.**
 - Appeared in: S25 (Q4c, 07 marks)
3. **Differentiate between text I/O and binary I/O.**
 - Appeared in: S23 (Q4b, 04 marks), W25 (Q3b-ii, 02 marks)

Other Important Questions:

1. **Explain binary I/O classes.**
 - Appeared in: S24 (Q4c, 07 marks)
 2. **Write a program to read a text file using any I/O class.**
 - Appeared in: S24 (Q4c, 07 marks)
 3. **Explain DataInputStream and DataOutputStream with example.**
 - Appeared in: W23 (Q5c, 07 marks)
 4. **List various classes for binary I/O.**
 - Appeared in: W23 (Q5a, 03 marks)
 5. **What are the benefits of using generic types? How to declare a generic class?**
 - Appeared in: W25 (Q5a, 03 marks)
 6. **How to declare and invoke a generic method?**
 - Appeared in: W25 (Q5a, 03 marks)
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Unit 10: Lists, Stacks, Queues, Priority Queues

Repeated Questions:

1. **Differentiate between ArrayList and LinkedList.**
 - Appeared in: S25 (Q5a, 03 marks), W23 (Q4c, 07 marks)
2. **Explain LinkedList collection class with example.**
 - Appeared in: S25 (Q5c, 07 marks)

Other Important Questions:

1. **Explain ArrayList with its methods.**
 - Appeared in: W23 (Q5b, 04 marks)
 2. **Write a program to add elements to ArrayList, sort in descending order, and display.**
 - Appeared in: S22 (Q4c, 07 marks)
 3. **Write a program to add ten elements in a list and traverse in both directions.**
 - Appeared in: W25 (Q4c, 07 marks)
 4. **What is Vector class?**
 - Appeared in: W22 (Q5a, 03 marks)
 5. **Name the class/interface for:**
 - (i) Dynamic array storing duplicates, maintains insertion order.
 - (ii) LIFO data structure.
 - (iii) FIFO data structure.
 - (iv) Priority queue.
 - Appeared in: S24 (Q5c, 07 marks)
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Unit 11: Sets and Maps

Repeated Questions:

1. **Explain Set and Map with examples.**
 - Appeared in: W22 (Q5c, 07 marks)
2. **Describe and compare HashMap, LinkedHashMap, and TreeMap.**
 - Appeared in: W25 (Q4c, 07 marks)

Other Important Questions:

1. **Explain Sets with examples.**
 - Appeared in: S25 (Q5c, 07 marks)
 2. **What is TreeMap? How does it store key-value pairs?**
 - Implied in collection framework questions.
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Unit 12: Concurrency and Threads

Repeated Questions:

1. **Explain thread life cycle.**
 - Appeared in: S25 (Q5b, 04 marks), S23 (Q3a, 03 marks), W22 (Q5b, 04 marks)
2. **Explain multithreading using Thread class.**
 - Appeared in: S22 (Q4b, 04 marks)
3. **Explain multithreading using Runnable interface.**
 - Appeared in: S22 (Q4b, 04 marks)

Other Important Questions:

1. **Explain Runnable interface.**
 - Appeared in: S25 (Q5b, 04 marks)
2. **Explain synchronization in threads with example.**
 - Appeared in: W22 (Q5c, 07 marks)
3. **Create a Customer class extending Thread with synchronization.**
 - Appeared in: W24 (Q5c, 07 marks)
4. **Differentiate between Thread class and Runnable interface.**
 - Appeared in: S23 (Q3b, 04 marks)
5. **Explain thread states and life cycle with diagram.**
 - Appeared in: S23 (Q3a, 03 marks)
