Seat No: .....

Enrollment No: .....

# PARUL UNIVERSITY
# FACULTY OF IT & COMPUTER SCIENCE
# MCA(A.Y.-II) / M.Sc.IT Winter 2024-25 Examination

**Semester: I**
**Subject Code: 05201201 / 05202110**
**Subject Name: Java Programming /Object Oriented Programming using Java**

**Date: 18-12-2024**
**Time: 02:00 PM TO 04:30 PM**
**Total Marks: 60**

**Instructions:**

1. All questions are compulsory.
2. Make suitable assumptions whenever necessary.
3. Write the answers for both sections on separate answer sheets.

| SECTION - A [30 Marks] | | | | |
|---|---|---|---|---|
| **Q1** | **Answer the following questions:** | **[20]** | **CO** | **BT** |
| (a) | Answer **all** questions | (5) | | |
| i. | Which programming paradigm emphasizes the use of functions and procedures?<br>(A). a) Object-Oriented Programming<br>(B). b) Procedure-Oriented Programming<br>(C). c) Event-Driven Programming<br>(D). d) Logic Programming | 1 | CO1 | BT1 |
| ii. | What happens if an exception is not caught in a method?<br>(A). Compilation error<br>(B). The exception is ignored<br>(C). It is thrown to the calling method<br>(D). Program terminates immediately | 1 | CO3 | BT2 |
| iii. | Write a Java program that uses multiple threads to perform a concurrent task, such as calculating the sum of an array. | 1 | CO3 | BT3 |
| iv. | What is type casting in Java? | 1 | CO1 | BT1 |
| v. | Explain the difference between checked and unchecked exceptions in the context of built-in exceptions. | 1 | CO3 | BT2 |
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| (b) | Attempt Any **Five** Questions out of Seven | (15) | | |
| i. | Write a Java program that demonstrates exception handling while reading from a file that may not exist. | 3 | CO3 | BT3 |
| ii. | Explain how the ternary operator in Java simplifies conditional statements compared to using the traditional if-else structure. | 3 | CO1 | BT4 |
| iii. | What is the purpose of the Collections class in the Java Collection Framework? | 3 | CO3 | BT2 |
| iv. | Design a Java program that uses different data types, variables, and arrays to perform a specific task (e.g., calculating the average of numbers). | 3 | CO1 | BT3 |

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| v. | Identify how Java's encapsulation feature helps to control access to data compared to the global data handling approach in procedural programming. | 3 | CO1 | BT4 |
| vi. | Explain the steps to create a user-defined exception in Java. | 3 | CO3 | BT2 |
| vii. | Create a comprehensive Java application that reads a binary file using RandomAccessFile, modifies its content, and writes it back. | 3 | CO3 | BT3 |
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| **Q2** | **Answer/Solve following in detail (Attempt any 2 out of 3)** | **[10]** | | |
| (a) | Analyze the relationship between classes and objects in Java. How does this relationship promote code reusability? | 5 | CO1 | BT4 |
| (b) | Evaluate the effectiveness of handling multiple exceptions in a single catch block. What are the benefits and potential drawbacks of this approach? | 5 | CO3 | BT5 |
| (c) | Create a Java program that demonstrates the use of ForkJoinPool for parallel processing. Show how tasks can be divided and merged efficiently. | 5 | CO3 | BT6 |
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| | **SECTION - B [30 Marks]** | | | |
| **Q1** | **Answer the following questions:** | **[20]** | **CO** | **BT** |
| (a) | Answer **all** questions | (5) | | |
| i. | Which access specifier allows access only within the same class?<br>(A). private<br>(B). public<br>(C). protected<br>(D). default | 1 | CO2 | BT1 |
| ii. | How can you retrieve the selected item from a Choice control in AWT?<br>(A). Use the getSelectedItem() method<br>(B). Use the getText() method<br>(C). Use the getChoice() method<br>(D). Use the getSelectedValue() method | 1 | CO4 | BT2 |
| iii. | Create a Java program where a subclass Employee inherits from a superclass Person and adds additional attributes. | 1 | CO2 | BT3 |
| iv. | What does AWT stand for in Java? | 1 | CO4 | BT1 |
| v. | Explain the difference between method overloading and method overriding. | 1 | CO2 | BT2 |
| | | | | |
| (b) | Attempt Any **Five** Questions out of Seven | (15) | | |
| i. | Create an AWT application where you handle both focus and window events using FocusListener and WindowListener, and print specific messages when the component gains focus or the window is minimized. | 3 | CO4 | BT3 |
| ii. | Explain the process of creating a package in Java, and analyze its role in organizing classes and interfaces for better code management. | 3 | CO2 | BT4 |

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| iii. | How does the Graphics class handle rendering shapes in a Java window or applet? | 3 | CO4 | BT2 |
| iv. | Implement a program that defines a superclass Account and subclasses SavingsAccount and CheckingAccount, demonstrating method overriding and constructor chaining. | 3 | CO2 | BT3 |
| v. | Analyze the Flow Layout manager in Java AWT, explaining how it arranges components in a container and discussing its default behavior when the container is resized. | 3 | CO4 | BT4 |
| vi. | Explain the difference between method binding and variable binding. | 3 | CO2 | BT2 |
| vii | Write an AWT application that combines List, Button, and TextField controls where the user selects items from a list and the selected items are displayed in a text field when a button is clicked. | 3 | CO4 | BT3 |
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| **Q2** | **Answer/Solve following in detail (Attempt any 2 out of 3)** | **[10]** | | |
| (a) | Analyze how the super keyword is used in Java to refer to the superclass. Explain how it can be applied in method overriding with a practical example. | 5 | CO2 | BT4 |
| (b) | Evaluate the effectiveness of applet security restrictions. What measures can be taken to ensure applets operate safely in a browser environment? | 5 | CO4 | BT5 |
| (c) | Design a Java application that combines the final keyword with abstract classes and interfaces. Implement a scenario where final methods are used in an abstract class to enforce a certain behavior in subclasses. | 5 | CO2 | BT6 |
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