*Total No. of Questions: 6* *Total No. of Printed Pages:3*

**Enrollment No.....**

Faculty of Engineering / Science

End Sem Examination Dec 2024

CS3CO32 / BC3CO37 Java Programming

Programme: B.Tech./B.Sc. Branch/Specialisation: CSE All / Computer Science

**Duration: 3 Hrs.** **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

| | | | Marks | BL | PO | CO | PSO |
|---|---|---|---|---|---|---|---|
| Q.1 | i. | Which tool in the JDK is used to compile a Java program?<br>(a) java (b) javac<br>(c) javadoc (d) javap | **1** | 1 | 1 | 1 | |
| | ii. | What is the Unicode value of the character 'A' in Java?<br>(a) 97 (b) 65 (c) 48 (d) 50 | **1** | 1 | 5 | 1 | |
| | iii. | Which package is automatically imported into every Java program?<br>(a) java.util (b) java.io<br>(c) java.lang (d) java.net | **1** | 1 | 1 | 2 | |
| | iv. | Static binding in Java occurs with:<br>(a) Method overriding<br>(b) Method overloading<br>(c) Instance variables<br>(d) Constructors only | **1** | 1 | 5 | 2 | |
| | v. | Which of these will concatenate two strings in Java?<br>(a) + (b) concat()<br>(c) append() (d) All of these | **1** | 1 | 9 | 2 | |
| | vi. | What is the default capacity of a StringBuffer object in Java?<br>(a) 10 characters (b) 16 characters<br>(c) 20 characters (d) 32 characters | **1** | 1 | 12 | 2 | |

P.T.O.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| vii. | What is an exception in Java?<br>(a) A runtime error that cannot be handled<br>(b) A problem that arises during program execution<br>(c) A compile-time error<br>(d) A syntax error | **1** | 1 | 2 | 3 | | |
| viii. | What is a daemon thread in Java?<br>(a) Runs in the background<br>(b) Cannot be stopped<br>(c) Runs only once<br>(d) Higher priority | **1** | 1 | 4 | 3 | | |
| ix. | Which AWT class represents a window with a title bar and borders?<br>(a) Panel (b) Frame<br>(c) Container (d) Component | **1** | 1 | 2 | 4 | | |
| x. | Which class is used to write primitive data types to a file in Java?<br>(a) FileInputStream<br>(b) FileOutputStream<br>(c) BufferedOutputStream<br>(d) PrintStream | **1** | 1 | 5 | 4 | | |
| Q.2 | i. What are literals, identifiers, and keywords in Java? Provide examples of each. | **4** | 2 | 1 | 1 | | |
| | ii. What are the main differences between Java, C, and C++ in terms of memory management, syntax, performance, and areas of application? | **6** | 2 | 9 | 1 | | |
| OR | iii. Write a Java program to check if a given year is a leap year. Explain how your program works and discuss the logic you used. | **6** | 4 | 5 | 1 | | |
| Q.3 | i. Explain Dynamic Method Dispatch in Java with an example. Why is it also called runtime polymorphism? | **4** | 2 | 5 | 2 | | |
| | ii. Explain inheritance in Java and its types. Why is multiple inheritance not supported directly in Java, and how does Java address this limitation? | **6** | 2 | 2 | 3 | | |



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| OR | iii. Write a Java program that demonstrates the use of an interface Shape with methods area() and perimeter(). Implement this interface in two classes, Circle and Rectangle. Show the flexibility of using interfaces in the program. | **6** | 4 | 1 | 2 | | |
| Q.4 | i. Write a Java program to extract a substring from a given string and replace certain parts of it using substring() and replace(). | **3** | 3 | 4 | 3 | | |
| | ii. Explain the difference between String, StringBuilder, and StringBuffer. | **7** | 2 | 5 | 2 | | |
| OR | iii. Describe the five different methods available in the String class for string manipulation. Provide examples for each method | **7** | 2 | 2 | 3 | | |
| Q.5 | i. Define an exception in Java. Explain the difference between checked and unchecked exceptions with examples. | **4** | 2 | 5 | 3 | | |
| | ii. Describe the life cycle of a thread in Java. Explain each state in the life cycle. | **6** | 1 | 9 | 2 | | |
| OR | iii. Discuss the try, catch, finally, throw, and throws keywords in Java with examples. | **6** | 2 | 12 | 3 | | |
| Q.6 | Attempt any two: | | | | | | |
| | i. Explain the FileInputStream and FileOutputStream classes. Provide a code example that reads data from one file and writes it to another. | **5** | 4 | 1 | 2 | | |
| | ii. Explain the basic structure of an applet in Java. What are the main components and methods? | **5** | 2 | 4 | 3 | | |
| | iii. Explain the differences between Panel, Frame, and Container in the AWT library. How does each class function as part of the AWT component hierarchy? | **5** | 2 | 2 | 4 | | |

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## Marking Scheme

CS3CO32-BC3CO37 Java Programming

| | | | |
|---|---|---|---|
| Q.1 | i) | b) javac | **1** |
| | ii) | b) 65 | **1** |
| | iii) | Which package is automatically imported into every Java program?<br>c) java.lang | **1** |
| | iv) | Static binding in Java occurs with:<br>b) Method overloading | **1** |
| | v) | d) All of the above | **1** |
| | vi) | b) 16 characters | **1** |
| | vii) | b) A problem that arises during program execution | **1** |
| | viii) | a) Runs in the background | **1** |
| | ix) | b) Frame | **1** |
| | x) | d) PrintStream | **1** |
| Q.2 | i. | What are literals, identifiers, and keywords in Java? **(each 1 marks)** Provide examples of each**. ( 1 marks)** | **4** |
| | ii. | What are the main differences between Java, C, and C++ in terms of memory management, syntax, performance, and areas of application? **( each 1.5 marks)** | **6** |
| OR | iii. | Write a Java program to check if a given year is a leap year. Explain how your program works and discuss the logic you used. 3+3 Marks | **6** |
| Q.3 | i. | Explain Dynamic Method Dispatch in Java with an example. Why is it also called runtime polymorphism? 2+2 Marks | **4** |
| | ii. | Explain inheritance in Java and its types. **(3 marks)** Why is multiple inheritance not supported directly in Java, and how does Java address this limitation? **( 3 marks)** | **6** |
| OR | iii. | Write a Java program that demonstrates the use of an interface Shape with methods area() and perimeter(). Implement this interface in two classes, Circle and Rectangle. Show the flexibility of using interfaces in the program. | **6** |
| Q.4 | i. | Write a Java program to extract a substring from a given string and replace certain parts of it using substring() and replace().1.5 & 1.5 Marks | **3** |
| | ii. | Explain the difference between String, StringBuilder, and StringBuffer. **( Atleast 4 difference )** | **7** |
| OR | iii. | Describe the five different methods available in the String class for string manipulation. Provide examples for each method | **7** |
| Q.5 | i. | Define an exception in Java. Explain the difference between checked and unchecked exceptions with examples. 2+2 Marks | **4** |
| | ii. | Describe the life cycle of a thread in Java. Explain each state in the life cycle Diagram -2 Marks, Explanation - 4 Marks | **6** |
| OR | iii. | Discuss the try, catch, finally, throw, and throws keywords in Java with examples. 1 Mark each(5) + 1 Mark Example | **6** |
| Q.6 | | Attempt any two: | |
| | i. | Explain the FileInputStream and FileOutputStream classes. Provide a code example that reads data from one file and writes it to another. Code 3 marks + Theory 2 marks | **5** |
| | ii. | Explain the basic structure of an applet in Java. What are the main components and methods. Applet 2 marks method 3 marks | **5** |
| | iii. | Explain the differences between Panel, Frame, and Container in the AWT library. How does each class function as part of the | **5** |

[2] [3]

AWT component hierarchy. (3+2) Marks

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