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Name :



MAR ATHANASIOUS COLLEGE OF ENGINEERING, KOTHAMANGALAM

(Govt. Aided Autonomous Institution)

Second Semester B.Tech. Degree Examination, May, 2026

Course Code: B24CS1T03

Course Name: OBJECT ORIENTED PROGRAMMING

Max. Marks: 100

Duration:3 Hours

PART - A: 30 Marks (10 Qns x 3 Marks)

Answer all questions

1. Name the four integer types in Java and outline the bitwise operators that can be applied to the integer types.
2. What are literals in Java?
3. List three special features of constructors that sets it apart from regular functions.
4. What is the purpose of the super keyword in Java?
5. How do you import a package in Java? Explain with an example.
6. Describe the functionality of the PrintWriter class.
7. Identify the thread that begins execution when a Java program starts and explain its role in program execution.
8. List any three event sources and their corresponding event types and listeners used.
9. List three key features of the Swing framework.
10. List any three Swing layout managers and write one-line descriptions for each.

PART - B: 70 Marks (5 Qns x 14 Marks)

Answer any One full question from each module.

Module 1

11. a. Explain the function-oriented and object-oriented software design approaches with reference to an automated fire alarm system. (7 Marks)
b. Draw a UML activity diagram for an order processing system. (7 Marks)

OR

12. a.Explain the Java Programming Environment and Runtime Environment in detail. (7 Marks)
b.Describe the architecture of the Java Virtual Machine (JVM) and explain how it enables Java to be platform-independent. (7 Marks)

Module 2

13. a.Explain how variable-length arguments (varargs) can be used along with command-line arguments in Java. Write a Java program that accepts numbers via command-line arguments and calculates their product using varargs. (7 Marks)
b.Define the final keyword with respect to variables, methods, and classes. Provide an example showcasing a `final` variable. (7 Marks)

OR

14. a.Write a Java program that accepts a sentence from the user and counts the number of vowels (a, e, i, o, u) in it. Use `charAt()` to traverse the string character by character. (7 Marks)
b.What is the difference between `StringBuffer` and `StringBuilder` in Java? (7 Marks)

Module 3

15. a.Write a Java program that demonstrates the use of nested try-catch blocks by performing a division operation inside the inner try block to handle an Arithmetic Exception, and accessing an array element in the outer try block to handle a potential Array Index Out Of Bounds Exception. (7 Marks)
b.Write a Java program that applies the use of `throw` and `throws` by defining a method which checks for invalid input and explicitly throws an exception when such input is detected. Demonstrate how the exception is handled in the calling method. (7 Marks)

OR

16. a. Explain the character stream classes for working with files. Develop a Java program to transform the contents of “input.txt” by converting each line to uppercase and store the result in “output.txt”. (6 marks)
b. Create a class representing a student object with attributes like name, roll number, and department. Implement methods to serialize and deserialize student objects to and from a file. (8 marks)

Module 4

17. a. Write a program that creates two threads. First thread prints the numbers from 1 to 100 and the other thread prints the numbers from 100 to 1. Execute the two threads in parallel. (7 marks)
b. Discuss the difference between a synchronized method and a synchronized block. (7 marks)

OR

18. a. Explain the purpose of an Iterator in Java. How does it differ from ListIterator? (7 marks)
- b. Write a Java program to store a list of student names using an ArrayList. Use an Iterator to traverse the list and remove any student whose name starts with the letter "A". Display the updated list after removal. (7 marks)

Module 5

19. a. Develop a Java program to demonstrate the execution of create and insert queries using JDBC. (4 marks)
- b. Write sample code to establish database connectivity in Java. Discuss the various steps involved. (10 marks)

OR

20. a. Explain how you would use a specific method to control the active state of a JButton in a Java Swing application. Identify the class that provides this capability. (4 marks)
- b. Design a Swing program with a frame titled 'User Interaction Demo', using FlowLayout and setting the frame size to 230×100. The frame should include two buttons, Yes and No, along with a label displaying the message 'Make a choice'. When the Yes button is clicked, the label should change to 'You selected Yes', and when the No button is clicked, it should update to 'You selected No'. (10 marks)
