

2025

MCA 3rd Semester Examination

MCA

Paper : MCA - 301

(Advanced Java)

Full Marks : 100

Time : Three Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any five questions : $2 \times 5 = 10$

1. Define byte code. How does it make Java platform-independent? 1+1
2. What is the difference among JDK, JRE, and JVM?
3. Mention the purpose of the 'final' keyword in Java.
4. What are checked and unchecked exceptions?
5. Write the role of 'this' keyword.
6. What do you mean by garbage collection in Java?
7. Why is any marker interface used in Java? Give an example. 1+1
8. What is the use of Scanner class in Java I/O?

P.T.O.

(2)

Group - B

Answer any *four* questions : $15 \times 4 = 60$

9. Define encapsulation and polymorphism with suitable examples. Discuss abstraction and its implementation using abstract classes. Write a Java program demonstrating method overriding. $5+5+5$
10. Briefly discuss different types of inner classes with suitable examples. What are the different types of constructors used in Java? What is the purpose of `finalize ()` method? $10+3+2$
11. Describe the process of creating and using multi-dimensional arrays in Java. Describe static variables and methods with suitable examples. Briefly discuss the concept of immutable and mutable strings in Java with suitable examples. $5+5+5$
12. Explain the concept of inheritance and the role of 'super' keyword in it. Describe the concept of dynamic method dispatch with an example. Differentiate between single and multilevel inheritance. $8+4+3$
13. What is an interface? How is it different from an abstract class? Explain the process of creating and importing packages using suitable examples. $2+3+10$
14. Explain the working principle of try, catch, throw, throws, and finally blocks in exception handling with suitable examples. Write a Java program to create and use a user-defined exception class. $10+5$

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15. Explain the life cycle of a thread using a diagram. Define thread synchronization with an example. Write a Java program to create two threads that print even and odd numbers alternately. 5+5+5
16. Describe the life cycle of a Servlet. Write a short note on the use of JSP scripting elements and directives. What are Java frameworks and how are they used for building enterprise-level applications? 5+5+5

Internal Assessment : 30 marks
