

2025

COMPUTER SCIENCE — MDC

Paper : CC-5

(Object Oriented Programming)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer **any five** from the following questions : 2×5
- (a) Define Instance Variables.
 - (b) How are 1D arrays declared in Java? Give an example.
 - (c) Define Exceptions.
 - (d) Write any two methods of the Thread Class.
 - (e) What is the impact of using the final keyword on a variable?
 - (f) What are constructors?
 - (g) What do you mean by function signature?
 - (h) State the significance of the void keyword.

Section - A

Answer **any three** from the following questions.

2. Write a program in Java that takes a positive number as input and calculates the factorial of the number using recursion. The factorial of a number is the product of all the natural numbers till the number itself. ($n! = 1*2*3*...*n$). 5
3. Explain the concept of method overriding with an example. 5
4. What is Method Overloading? Explain the various constraints of Method Overloading with an example. 1+4
5. Define Encapsulation and Abstraction. Explain how does encapsulation ensure abstraction. (1+1)+3
6. What are Applets? How do applet-based applications differ from console-based applications? 2+3

Please Turn Over

(2922)

Section - B

Answer *any five* from the following questions.

7. (a) State the differences between the Procedure-Oriented Programming paradigm with the Object-Oriented Programming paradigm.
(b) What are class variables? How do you declare class variables?
(c) Write a short note on JVM. 3+(2+1)+4
8. (a) What is Inheritance? State the advantages of using Inheritance.
(b) Describe the various types of Inheritance available in Java, with a suitable example. (2+2)+6
9. Write a program that takes a filename as input from the user, reads the file and displays the number of vowels present in the file. 10
10. (a) What is an Interface? How do Interfaces differ from Abstract classes?
(b) What is Multiple Inheritance? How do we use Interfaces to emulate Multiple Inheritance in Java? (2+2)+(3+3)
11. (a) What is the difference between 'error' and 'exception' in Java?
(b) Illustrate the 'ArrayIndexOutOfBoundsException' exception with an example.
(c) Create an exception named 'NotPi'. Write a program in Java that takes a number as input from the user and prints it. This program will invoke the 'NotPi' exception when the number inputted by the user isn't 3.14. 3+2+(2+3)
12. (a) Create two threads : one to print even numbers and another for odd numbers (1-20).
(b) Explain the concept of abstract classes with an example. 6+4
13. (a) Explain inner classes and anonymous inner classes with examples.
(b) What are adapter classes? How are they differ from abstract classes? 5+(2+3)
14. Write short notes on (*any two*) : 5×2
(a) Dynamic Method Dispatch
(b) Event Handling in Java
(c) Enums in Java
(d) Constructor Overloading.
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