# Question Paper - Report

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Question Paper

## MANIPAL ACADEMY OF HIGHER EDUCATION

**II semester B.Tech MID-TERM Examination**
**(04-03-2025)**
**INTRODUCTION TO OBJECT ORIENTED PROGRAMMING [ICT 1271]**

**Marks: 30** **Duration: 90 mins.**

**A**

**Answer all the questions.** Section Duration: 20 mins

Select the correct answer for the following questions

1) What is the output of following code snippet? (0.5)

```
int Arr[][]=new int[3][];
Arr[0]=new int[2];
Arr[1]=new int[4];
Arr[2]=new int[3];
System.out.println(Arr[1].length);
```

3 4 2 Compilation error

2) What happens when you compile the below code snippet? (0.5)

```
String s1="hello";
String s2=s1.substring(0,5); s2=s2.intern();
if (s1==s2) System.out.println("hello");
```

No output. Compilation error Prints hello Runtime error

3) Which of the following is NOT a Java primitive data type? (0.5)

byte String int float

4) Which of the following best describes Java's Just-In-Time (JIT) compiler? (0.5)

It converts Java source code directly to machine code. | It compiles entire Java programs before execution. | It compiles bytecode into native machine code at runtime. | It does not affect Java's execution speed

5) What will be the output of the following code? (0.5)

```
int a=0,b=8;
if((a!=0 )&& ((++b)/a >2)) System.out.println(a);
else System.out.println(b);
```

8 Compilation error 9 None of the options

6) What will be the output of the following code? int a = 5, b = 10; (0.5)

```
if (a++ > 5) {
if (b-- > 10) {
System.out.println("X");
} else {
System.out.println("Y");
}
} else {
if (++b > 10) {
System.out.println("Z");
} else {
System.out.println("W");
}
}
System.out.println("a: " + a + ", b: " + b);
```

X, a: 6, b: 9 Y, a: 6, b: 9 Z, a: 6, b: 10 W, a: 6, b: 11

7) Choose which of the following code snippets will NOT compile? (0.5)

String s1 = "Object"; String s2 = s1.concat(" Oriented"); | String s1 = "Object"; StringBuilder sb = new StringBuilder(s1); sb.append(" Oriented"); | String s1 = new String("Object"); String s2 = s1.substring(0, 2); | String s1 = "Object"; s1.setCharAt(0, 'P');

8) (0.5)

```
public class Test {
public static void main(String[] args) {
String s1 = "abc";
String s2 = new String("abc");
String s3 = "abc";
System.out.println(s1 == s2);
System.out.println(s1 == s3);
}
}
```

true false false true false false true true

9) Which of the following statements about Java constructors is FALSE? (0.5)

A constructor can be private. | A constructor cannot be overloaded. | A constructor is called automatically when an object is created. | If no constructor is defined, Java provides a default constructor.

10) What will be the output of the following Java program? (0.5)

```
class Demo {
int x = 5;
void changeValue(Demo d) {
d.x += 10;
}
public static void main(String args[]) {
Demo obj1 = new Demo();
Demo obj2 = obj1;
obj2.changeValue(obj1);
System.out.println(obj1.x);
}
}
```

5 10 15 Compilation error

**B**

**Answer all the questions.**

Answer all the questions.Any missing data can be assumed suitably with proper reasoning.

11) Write a Java program to define a class called Matrix that has a 2D array of integers and the following methods. (5)

a) A parameterized constructor to receive two integers (m and n) as parameter and allocate memory basic for the 2D array of size m*n.

b) Another parameterized constructor to receive an integer 2D array and allocate memory to the instance variable and initialize the array with the contents of the array received.

c) Method to display the Matrix using for each loop

d) Method find() to return a 1D array containing all prime numbers in the matrix.

Test class Matrix with class MatrixDemo having main method to test all the methods of the class appropriately.

12) Define a class called BillPayment with paymenttype,amount,details.For thisgiven BillPayment class, demonstrate constructor overloading for three types of payment. That is for cash on delivery, card, and UPI payments. Instantiate the BillPayment class using each overloaded constructor. Call the processPayment() method on each instance to display the corresponding payment details. (5)

13) Create a class Smartphone that contains an inner class Processor. Implement the following: (5)

1.The Smartphone class should have an instance variable brand and a constructor to initialize it.

2.The inner class Processor should have instance variables cores (int) and clockSpeed (double, in GHz) with a constructor to initialize them.

3.The Processor class should have a method displayProcessorDetails() that prints the smartphone brand, number of cores, and clock speed.

Implement the necessary logic in the main() method to create a Smartphone object and associate it with a Processor object. Then, display the processor details.

14) Design a Java program for an automobile manufacturing plant that tracks production.Create a class Car with instance variables for details such as **model** (a String) and **productionNumber** (an int). Use a static variable to count the total number of cars produced. Implement a static method **displayProductionSummary()** that prints the total production count. In the main class, simulate the production of multiple cars by creating Car objects and then display the production summary using the static method. (4)

15) A retail store needs a program to calculate the final bill for a customer purchasing multiple products. The program should: (4)

Store the prices of 5 products in an array. Ask the customer to enter a discount percentage and a tax percentage.Find the total price of all products before applying any discount or tax. Apply the discount, then add tax, and compute the final amount the customer has to pay. Make sure that:

The total price of products can be stored in a variable that allows decimal values.[type casting]

The discount and tax percentages, given by the customer, are rounded to whole numbers before use.

Display:

The total price before applying any discount or tax.

The amount after applying the discount.

The final amount the customer must pay after adding tax .

16) List the conditions under which automatic type conversion takes place in Java. What are the type promotion rules in Java for expressions? . (2)