

Theory:

1. What do you understand by IPO in the context of programs?
2. Write down four features of Java.
3. Java is case-sensitive. What does it mean?
4. Write down the sizes of each data type in bytes.
5. Why is String not a primitive type?
6. Distinguish between unary and binary operators.
7. Write down the precedence of logical operators.
8. Distinguish between / and %.
9. Distinguish between = and ==.
10. Distinguish between && and ||
11. Write the extensions of Java source code and bytecode.
12. How does Java use both a compiler and an interpreter?
13. Write the full forms of JRE, JDK, and JVM.
14. What is JVM?
15. What is a class and a package?
16. Distinguish between System.out.print() and System.out.println().
17. Adding two Strings performs concatenation. What does it mean?
18. What is type casting or type conversion? What are its types?
19. What are comments in Java? Write down their types.
20. What are the types of errors in Java? Explain each.
21. Name the package that is invoked by default in Java.
22. Is Java an object-oriented programming language or a procedure-oriented language?
23. What are the ASCII codes for 'A' to 'Z', 'a' to 'z', '0' to '9', and space?
24. How is the postfix and prefix usage of unary increment and decrement operators different? Explain with an example.
25. What are normal flow and conditional flow in Java?
26. Name the package to which the Math library belongs.
27. Write down the return types of Math.max(), Math.min(), Math.sqrt(), and Math.pow().
28. What are access specifiers?
29. What do void and static mean?
30. How is using multiple if() statements different from using an if-else ladder?

Snippets:

1.

```
char a= (char) ('A'+32); a
System.out.println(a);
```
2.

```
System.out.println(Math.sqrt(1-10));
```
3.

```
System.out.println(2+3);
System.out.println("Sum="+2+3);
System.out.println("Sum=" + (2+3));
```
4.

```
int a=1/2;
double b= 1.0/2.0;
System.out.println(a);
System.out.println(b);
```
5.

```
char ch1= 'Z';
int n= ch1+ 32;
System.out.println(n);
System.out.println((char)n);
```

6. int a= 10, b=15, c=0;
c= a++ + --a - b- -;
a=? b=? c=?

7. int a=10, b=20;
a -= a-- + --b;
a=? b=?

8. int a= 2, b=4;
a*= a-- * a/b;
a= ?

9. int a= 2, b=4;
a*= a-- * a%b
a=?

10. int a= 3, b=6;
double c= a/b + b/a;
c=?

11. String s= "String";
int a=10;
int b=20;
s=s+a+b;
System.out.println(s);

Mathematical Snippets:

1. double a= Math.pow(Math.pow(2,3),2);
a=?

2. double p= Math.max(Math.round(2.5), Math.ceil(2.2));
p=?

3. System.out.println(Math.pow(25, 1/2)+4);

4. System.out.println(Math.pow(25, 1.0/2.0)+4);

5. Write the following expression in java:

$$x = \frac{|x-y|}{\sqrt{a^2-b^2}}$$

Find the type of error (if any)

1. int a= "Hello";
2. int x=10, y=5;
int c= (x*y)/(x%y);
3. int a= Math.pow(2,3);
4. System.out.print("Sum="+ (2*4));

Programs:

1. Take principal, rate and time from user and find simple interest and compound interest.

$$S.I. = \frac{P \times R \times T}{100} \quad C.I. = P \left(1 + \frac{R}{100n} \right)^t$$

2. Take two numbers from user and swap their values using a third variable.

3. Take two numbers from user and swap their values without using third variable.

4. Take three numbers and find the largest, smallest, and second smallest.

5. Take marks of five subjects and find sum and average of the numbers

6. take cost price and selling price from user and check if it's a profit, then print profit and profit percent, otherwise print loss and loss percent.

7. Take three angles of a triangle, check if the triangle possible or not. if possible check and print whether it is acute-angled, obtuse-angled or right-angled triangle.

8. Take three sides (length of sides) of a triangle, check if the triangle is possible or not. if possible, check and print whether it is equilateral, isosceles or scalene triangle.

9. take age from user and print whether the person can vote or not.

10. take a number from user and print whether it's positive, negative or neutral.

11. Take a number and check if it's even or odd.

12. Take a number and check if it's buzz number or not.

(A number is buzz if it ends with 7 or is divisible by 7)

13. Take amount from user and print discount. (Not chained calculation)

Net Bill in Rupees	Discount %
up to 2000	15 %
2001 to 8000	20 %
Above 10000	30%

Display discount and amount to be paid.

14. Take number of calls and calculate telephone bill (Chained Calculation)

No. Of Calls	Rate per call(in rupees)
First 100	Rs. 1.20 per call
Next 200	Rs. 2.00 per call
More than 300	Rs. 2.40 per call

Apart from this every consumer pays an extra amount of Rs. 150 as service charge

15. Take a two-digit number. Print sum and product of its digits.

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