

Q1. Answer the following by selecting ONE of the multiple options:

[1x20=20]

- i) Which programming paradigm emphasizes breaking down the problem into smaller parts through functions?
 - a) OOP
 - b) POP
 - c) Both OOP and POP
 - d) None

- ii) Which of the following statement(s) is/are incorrect about machine language?
 - a) It is difficult to debug
 - b) it requires a translator
 - c) Both a and b
 - d) None

- iii) Which principle of Java supports the concept of reusability?
 - a) Polymorphism
 - b) Inheritance
 - c) Encapsulation
 - d) Abstraction

- iv) Which of the following is responsible for making Java programs, Platform Independent?
 - a) Java Compiler
 - b) Java Virtual Machine
 - c) Java Runtime Environment
 - d) Java Development Kit

- v) Which of the following best describes a stand-alone application in Java?
 - a) It runs within a web browser
 - b) It requires an internet connection for execution
 - c) It operates on a web server for processing
 - d) It operates independently on a local machine

- vi) Which of the following describes an object in Java?
 - a) A blueprint for creating classes
 - b) An instance of a class with specific properties and behaviors
 - c) A method that defines class behavior
 - d) A reserved keyword in Java

- vii) The variables or values are used to representof an Object
 - a) State
 - b) Behaviour
 - c) Identity
 - d) All of the above options

- viii) The escape sequence for horizontal tab is :
- a) \t
 - b) \n
 - c) \b
 - d) \f
- ix) Which data type in Java is used to represent a single character?
- a) Char
 - b) char
 - c) Unicode
 - d) ASCII
- x) The datatype to store the result of a relational expression combined with logical operators is –
- a) int
 - b) double
 - c) boolean
 - d) String
- xi) The total number of primitive data types available in Java are :
- a) 2
 - b) 4
 - c) 8
 - d) 16
- xii) `System.out.println( 345/0)` istype of error
- a) Syntax
 - b) Logical
 - c) Runtime
 - d) No error
- xiii) Which derived data type can store constants of any data type?
- a) double
 - b) String
 - c) Character
 - d) Boolean
- xiv) Compound operators are also known as:
- a) Conditional Testing statement(s)
 - b) Conditional Operator(s)
 - c) Shorthand operator(s)
 - d) Assignment operator(s)
- xv) `double k=2025; System.out.println(k);` will give the following output:
- a) 2025
 - b) 2025.0
 - c) 2025.0d
 - d) 2025.0D

- xvi) Given, byte b=(byte)(23-25); Which data conversion does the statement represent?
- Type promotion
 - Type casting
 - Both a and b
 - None of the above
- xvii) When two operators have the same hierarchy, they are evaluated in theorder as they appear in the expression:
- Right to Left
 - Left to Right
 - Any order
 - Depends on the Interpreter
- xviii) Identify the Separator used in a compound statement
- { }
 - []
 - ()
 - comma(,)
- xix) Orphaned case is this type of error :
- Logical
 - Syntax
 - Runtime
 - Not an error
- xx) Identify the Conditional Testing statement(s) in Java:
- If..Else
 - if..else
 - else..if..
 - switch..case

Q2. Answer the following as directed:

[20]

- i) a) Rewrite using conditional statement :

double d=(p>5000) ? (p*18/100) : (p*.10) ;

[1]

- b) Write the value stored in d when p is 6000

[1]

- ii) Rewrite the following code using Ternary operator:

if(a>b)

{

if(a>10)

m=a;

else

m=b;

}

else

{ m=a+b; }

[2]

- iii) Rewrite using Multiple branching statement:

```
if(ch== 'N' || ch== 'n')
{ x=x-10; }
else if(ch== 'k')
{ x=x+10; }
else
System.out.println("Terminated");
```

[2]
- iv) Given , int x=4; x+= x++ + ++x - --x + x--; System.out.println("Value of x="+x);
Write the output showing the working alongside the output [2]
- v) Perform dry run and write the output :
int k=5,j=9; k+=k++ - ++j + k; System.out.println("K="+k + "and" + "j="+j); [2]
- vi) a) int intValue=obj.nextInt(); long longvalue=obj.nextLong();
double highvalue=obj.nextDouble();
.....result = intValue * longvalue – highvalue ; Write the data type of result [1]
b) System.out.println((11>12) && (-3<-2)); Mention the output [1]
- vii) Write Java expression for the following: [2]
- $$\sqrt{a \cdot x^3 + \frac{by^8}{cx + y}}$$
- viii) Write the output for the following:
System.out.println(Math.sqrt(Math.abs(Math.min(9,-9.9)))); [1]
System.out.println('A'+35+"35"); [1]
- ix) Debug and rewrite the correct code block :

```
if(x!=y+30)      System.out.println(x) ; else x>0 System.out.println(x*x);
```

[2]
- x) Write the output :

```
int a=obj.nextInt( );int b=7;
switch(a)
{
case 6 : case 4 : System.out.println(a+b); break;
case 7: System.out.println(a*b);
case 5: System.out.println(a-b) ;
default: System.out.println(a/b);
}
```

when (a) a=6 (b) a=7 (c) a=8 (d) a=4 [2]

SECTION-B

[Attempt any FOUR programs]

Question 3.

Define a class Commission to input name (String), code(int), sales(sales) of a sales person; calculate the commission (com), assign the bonus(bonus) and find the total amount (tot) from the following information:

Sales (Amount in Rs.)	Commission (% of Sales)	Bonus Amount
50,000 to 1,00,000	5	Nil
1,00,0001 to 2,50,000	10	Rs. 1000
2,50,001 to 5,00,000	12	Rs.1500
Above 5,00,000	15	Rs.1750

Total amount is the sum of Commission and the Bonus Amount

The output should include Name, Code, Sales, Commission, Bonus and total amount with suitable messages.

Note : words in (...) refers to the variable/identifier to be used.

Question 4.

Write a menu-driven program using multiple branching statement for the following :

Input a Choice - 'S', 'C' or 'D'.

For 'S', find and print the volume of a sphere ($v_s = \frac{4}{3} \pi r^3$)

For 'C', find and print the volume of a Cone ($v_c = \frac{1}{3} \pi r^2 h$)

For 'D', find and print the volume of a cylinder ($v_y = \pi r^2 h$)

For any other choice, display " Not a valid Choice"

Question 5.

- Write a program to input any two numbers. Print the original values. Swap/interchange the values of variables without using extra variable. Print the updated values of the variables with appropriate messages [7]
- Input any three numbers. Find and print the average value of the highest and lowest values. [8]

Question 6.

Design a class Rail to accept age of a customer and the distance travelled by him/her and then assign he fare on the following criteria:

Age (in years)	Distance (in Km.)	Fare (in rupees)
Below 10	Below 10	5
	10 to 50	20
	Above 50	50
From 10 to 60	Below 10	10
	10 to 50	40
	Above 50	80
Above 60	Below 10	4
	10 to 50	15
	Above 50	35

Display the Age of customer, Distance travelled and the Fare amount payable.

Question 7.

A security agency pays to their staff as per the rates as given below:

Number of hours	Rate allowed
First 200	Rate per hour
Next 100	Twice the Rate per hour
Next 100	Thrice the Rate per hour

Input Name of the employee, Number of hours worked and Rate per hour.

Calculate the Amount payable. Keep in mind that if any employee works beyond 400 hours, they would be paid only for 400 hours. Print Name of the employee, Number of Hours worked and Amount to be paid as Salary.

Question 8.

A shopkeeper offers discounts on different models of Air Conditioners as per the table given below:

Capacity	Discount on Premium Models	Discount on Deluxe models
1 ton	5%	3%
1.5 ton	7.5%	5%
2 tons	9%	7.5%
2.5 tons	10%	9%

Write a program to input the capacity, price and model of AC ('P' for Premium model or 'D' for Deluxe model). Calculate the discount and the amount to be paid by the customer. Display all the variables.

***** ALL THE BEST *****