

HALF YEARLY EXAMINATION: 2024-2025

CLASS: X C, D, E, F, G

SUBJECT: COMPUTER APPLICATIONS

NAME OF STUDENT.....

MAX. MARKS: 100

DATE.....

TIME: 2 HOURS

NOTE: You will not be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper. The time given at the head of this paper is the time allowed for writing the answers.

This paper is divided into two sections.

Attempt all questions from Section A and any four questions from Section B.

The intended marks for questions or parts of questions are given in brackets [].

SECTION A

(Attempt all questions from this Section.)

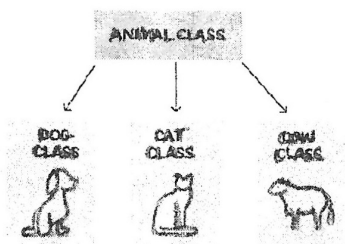
Question 1

[20]

Choose the correct answer and write the correct option.

(Do not copy the question, write the correct answers only.)

(i)



Name the feature of java depicted in the above picture.

- (a) Encapsulation (b) Inheritance
(c) Polymorphism (d) Abstraction
- (ii) Which method of Math class is used to calculate square root of a number?
(a) Math.sqrt() (b) Math.Sqrt()
(c) Math.SQRT() (d) Math.SquareRoot()
- (iii) Multiple branching statement of java is:
(a) while (b) do-while
(c) for (d) switch
- (iv) The number of bytes occupied by the integer 45 are:
(a) 8 bytes (b) 4 bytes
(c) 2 bytes (d) 16 bytes
- (v) Default delimiter used in the Scanner class is _____.
(a) Whitespace (b) Comma
(c) Semi colon (d) Dot
- (vi) Assertion(A): Operators are the special signs or symbols used to perform operations in java programming.
Reason(R): They are considered as tokens.
(a) Both Assertion(A) and Reason(R) are true and Reason(R) is a correct explanation of Assertion(A)
(b) Both Assertion(A) and Reason(R) are true and Reason(R) is not a correct explanation of Assertion(A)
(c) Assertion(A) is true and Reason(R) is false
(d) Assertion(A) is false and Reason(R) is true

- (vii) If int a=10 then find int x = ((++a) * (a--));
 (a) 100 (b) 90
 (c) 110 (d) 121
- (viii) Which of the following is a unary operator?
 (a) < (b) ?:
 (c) && (d) ++
- (ix) The method that changes the state of the object is known as:
 (a) pure method (b) impure method
 (c) return method (d) replace method
- (x) int result = 'A'; what is the value of result?
 (a) 65 (b) 66
 (c) A (d) 97
- (xi) How many values can a method return to its caller method?
 (a) 1 (b) 2
 (c) 3 (d) As many
- (xii) What will be the output of Math.sqrt(Math.abs(-64.0))?
 (a) 6.0 (b) -8.0
 (c) 8.0 (d) 0.0
- (xiii) What will be the output of Math.ceil(-4.2)?
 (a) -4.0 (b) -3.0
 (c) -4 (d) -3
- (xiv) The default value of a boolean variable is:
 (a) false (b) False
 (c) 0 (d) True
- (xv) Assertion(A): Java statements written in lowercase and uppercase are treated as the same.
 Reason(R): Java is a case sensitive language.
 (a) Both Assertion(A) and Reason(R) are true and Reason(R) is a correct explanation of Assertion(A)
 (b) Both Assertion(A) and Reason(R) are true and Reason(R) is not a correct explanation of Assertion(A)
 (c) Assertion(A) is true and Reason(R) is false
 (d) Assertion(A) is false and Reason(R) is true
- (xvi) Give the output of the following program segment:
 char op='w';
 switch(op)
 {
 case 'a':
 case 'e':
 case 'i':
 case 'o':
 case 'u': v='Y';
 break;
 default: v='N';
 }
 System.out.print(v);
 (a) Y (b) N
 (c) op (d) w
- (xvii) A constructor has _____ return type.
 (a) int (b) no
 (c) float (d) char
- (xviii) If int ar[] = {4, 2, 3, 5, 1}; what is the value of Math.pow(ar[1], ar[3])?
 (a) 16 (b) 6
 (c) 32 (d) 64

- (xix) If int n[] = {16, 27, 8, 64, 18}; what is value of Math.cbrt(Math.max(n[1], n[2]))?
 (a) 3.0 (b) 2.0
 (c) 4.0 (d) 5.0
- (xx) If arr[]={3, 6, 4, 7, 2, 1}; what will be the value of x?
 x=arr[3]*arr[1]+arr[4];
 (a) 43 (b) 14
 (c) 23 (d) 44

Question 2

- (i) Write the Java expression for: [2]

$$\frac{\sqrt{3x+x^2}}{a+b}$$
- (ii) Give the output of the following code segment: [2]

```
int a=5;
a+= ++a + a++ + a;
```
- (iii) Write the statement to: [2]
 (a) input a double data from the standard input device using Scanner class method.
 (b) input a char data from the standard input device using Scanner class method.
- (iv) Identify and name the following tokens: [2]
 (a) public
 (b) 'a'
 (c) ==
 (d) []
- (v) Classify the following as primitive or non-primitive: [2]
 (a) char
 (b) arrays
- (vi) Convert the following if else if construct into switch case: [2]

```
if(var==1)
    System.out.print("good");
else if(var==2)
    System.out.print("better");
else if(var==3)
    System.out.print("best");
else
    System.out.print("invalid");
```
- (vii) Name any two types of errors in java program. [2]
- (viii) If int x[]={4,3,7,8,9,10}; what are the values of a and b [2]
 (a) a=x[2] + x[3] * x[1];
 (b) b=x.length;
- (ix) Rewrite the following code using ternary operator: [2]

```
if(age>60)
    System.out.println("Senior citizen");
else
    System.out.println("Not a senior citizen");
```
- (x) Name the different types of constructors. [2]

SECTION B

(Answer any four questions from this Section.)

The answers in this section should consist of the programs in either BlueJ environment on any program environment with java as the base.

Each program should be written using variable description/mnemonic codes so that the logic of the program is clearly depicted.

Flowcharts and algorithms are not required.

Buffered Reader/ Data Input Stream should not be used in the programs.

Question 3**[15]**

Write a menu driven program to accept a number from the user and check:

- whether it is an Armstrong number or not. An Armstrong number is a number which is equal to the sum of digits raise to the power 3. Example: $153 = 1^3 + 5^3 + 3^3$
- whether it is a Composite number or not. A composite number is a number that has more than 2 factors. Example 10 is a composite number, its factors are 1, 2, 5, 10.

Question 4**[15]**

Given below is a hypothetical table showing rates of Income Tax for male citizen below the age of 65 years:

Taxable Income(TI)	Income Tax Calculations
$\leq 1,60,000$	NIL
$> 1,60,000$ and $\leq 5,00,000$	$(TI - 1,60,000) * 10\%$
$> 5,00,000$ and $\leq 8,00,000$	$((TI - 5,00,000) * 20\%) + 34,000$
$> 8,00,000$	$((TI - 8,00,000) * 30\%) + 94,000$

Write a program in Java to input the age gender(male or female) and Taxable Income of a person. If the age is more than 65 years or the gender is female, display "wrong category". If the age is less than or equal to 65 years and the gender is male, compute and display the Income Tax payable as per the table given above.

Question 5**[15]**

Define a class to overload the method print() as follows:

void print(): To display the following pattern using nested loop:

```

1
2 1
3 2 1
4 3 2 1
5 4 3 2 1

```

void print(int x, char ch): with one integer argument and one character argument that draws a filled square of side x using the character stored in ch. Example: if x=3 and ch='O'

```

Output: OOO
      OOO
      OOO

```

Question 6**[15]**

Define a class to accept values into a 3x3 array and check if it is a special array. An array is said to be special if the sum of all the rows are equal.

Example:

```
A[][]={{2,4,3},{5,2,2},{2,6,1}};
```

Sum of the first row=2+4+3=9

Sum of the second row=5+2+2=9

Sum of the third row=2+6+1=9

Question 7**[15]**

Write a java program to check whether the given number is Lead number or not. A Lead number is a number whose sum of even digits is equal to the sum of odd digits. For example, if the number is 3669, its sum of evendigits is 6+6=12 and sum of odd digits 3+9=12.

Question 8**[15]**

Define a class to accept 10 integers and arrange them in ascending order using bubble sort technique. Print the original array and the sorted array

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