

HALF-YEARLY EXAMINATION: 2023-2024

CLASS: X C, D, E

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 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.)

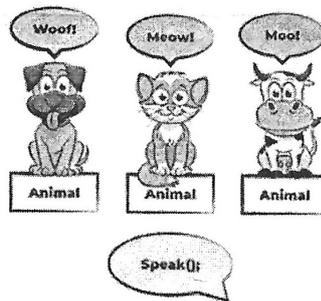
Question 1

[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) Abstraction
 - (d) Polymorphism
- (ii) Name the package that contains Math class.
- (a) java.lang
 - (b) java.util
 - (c) java.utility
 - (d) java.io
- (iii) Method overloading follows which principle of Object Oriented Programming.
- (a) Abstraction
 - (b) Encapsulation
 - (c) Inheritance
 - (d) Polymorphism
- (iv) The number of bytes occupied by an integer array of 10 elements.
- (a) 40 bytes
 - (b) 20 bytes
 - (c) 80 bytes
 - (d) 64 bytes
- (v) Default delimiter used in the Scanner class is _____.
- (a) comma

- (b) colon
 (c) whitespace
 (d) semi colon
- (vi) The size of the double data type is _____.
- (a) 32 bits
 (b) 64 bits
 (c) 48 bits
 (d) 8 bits
- (vii) If `int p=10` then find `int a = ((++p) * (p++));`
- (a) 100
 (b) 120
 (c) 121
 (d) 110
- (viii) Which of the following changes a variable declaration to a constant?
- (a) `const`
 (b) `constant`
 (c) `static`
 (d) `final`
- (ix) Which of the following is a keyword?
- (a) `character`
 (b) `integer`
 (c) `continue`
 (d) `object`
- (x) Evaluate the value of `n`, if value of `p = 5` and `q = 19`
`int n = (q-p) > (p-q) ? (q-p) : (p-q);`
- (a) 5
 (b) 19
 (c) 14
 (d) -14
- (xi) Which of the following is mandatory in the switch statement?
- (a) `break`
 (b) `case`
 (c) `continue`
 (d) `default`
- (xii) What will be the output of `Math.abs(Math.max(-2.83, -5.83))`?
- (a) -2.83
 (b) 2.83
 (c) -5.83
 (d) 5.83
- (xiii) What will be the output of `Math.ceil(4.2)`?
- (a) 4.0
 (b) 4
 (c) 5.0
 (d) 5
- (xiv) Which of the following causes a fall through in the switch statement?
- (a) omission of `case`
 (b) omission of `default`
 (c) omission of `break`
 (d) omission of `continue`
- (xv) `Assertion(A)`: In Java the do-while loop executes at least once.
`Reason(R)`: In Java do-while loop checks the condition after executing the body of loop.
- (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:
- ```
int i;
for (i=5; i>10; i++);
System.out.println(i*4);
```
- (a) 40
- (b) 20
- (c) 36
- (d) Infinite loop
- (xvii) A constructor has \_\_\_\_\_ return type.
- (a) an int
- (b) a void
- (c) no
- (d) more than one
- (xviii) If int ar[ ] = {1, 4, 9, 16, 25}; what is the value of Math.sqrt(ar[2])?
- (a) 2.0
- (b) 3.0
- (c) 4.0
- (d) 5.0
- (xix) If int n[ ] = {1,2,3,5,7}; what is value of Math.pow(n[1], n[2])?
- (a) 1.0
- (b) 8.0
- (c) 5.0
- (d) 32.0
- (xx) If arr[]={3, 6, 4, 7, 2, 1}; what will be the value of b?
- ```
b=arr[3]*arr[5];
```
- (a) 7
- (b) 8
- (c) 6
- (d) 14

Question 2

- (i) Write the Java expression for: [2]
- $$A = \pi r^2$$
- (ii) Give the output of the following code segment: [2]
- ```
int x=3;
x = ++x + x++ + x;
```
- (iii) Name the method of Scanner class that: [2]
- (a) is used to input an integer data from the standard input device.
- (b) is used to input a line of text from the standard input device.
- (iv) Identify and name the following tokens: [2]
- (a) public
- (b) 'a'
- (c) ==
- (d) [ ]
- (v) Name the keyword which: [2]
- (a) indicates that a method has no return type.
- (b) makes the variable as a class variable.
- (vi) Determine how many times the loop will be executed and what will be the output of the program segment? [2]
- ```
int i;
for(i=5;i>=1;i--)
```



```
{
    if(i%2==1)
        continue;
    System.out.print(i+" ");
}
```

- (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 p and q [2]
 - (a) p=x.length;
 - (b) q=x[2] + x[5] * x[1];
- (ix) Rewrite the following code using ternary operator: [2]


```
if(bill>10000)
discount=bill*10.0/100;
else
discount=bill*5.0/100;
```
- (x) Differentiate between constructor and function. [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.

Question 3 [15]

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

- a) whether it is an Automorphic number or not. An automorphic number is a number whose squares last digit(s) are equal to that number. Example: if the number is 25, its square is 625 and 25 is present as the last two digits.
- b) whether it is a Buzz number or not. A buzz number is a number that ends with 7 or divisible by 7.

Question 4 [15]

The Electricity Board charges the bill according to the number of units consumed and the rate as given below:

| Units Consumed | rate per unit |
|-----------------|-------------------|
| First 100 units | 80 paisa per unit |
| Next 200 units | Rs. 1 per unit |
| Above 300 units | Rs. 2.50 per unit |

Write a program in Java to accept the total units consumed by a customer and calculate the bill. Assume that a meter rent of Rs. 500 charged from the customer.

Question 5 [15]

Define a class to overload the function display as follows:

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

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

void display(int x): To find and display the sum of the series: $S = x^1 - x^2 + x^3 - x^4 + \dots - x^{20}$

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 the left diagonal is equal to the sum of right diagonal.

Example:

```
A[][]={{2,1,3},{5,3,8},{4,7,5}};
```

Sum of the left diagonal=2+3+5=10

Sum of the right diagonal=3+3+4=10

Question 7

[15]

Write a java program to check whether the given number is Neon or not. A number is said to be Neon number if the sum of the digits of the square of the number is equal to the number itself. For example, if the number is 9, its square is $9*9=81$ and sum of the digits is also $9(=8+1)$.

Question 8

[15]

Write a program to input 10 integer elements in an array and sort them in ascending order using the Selection Sort technique.

-----END-----

$arr[i] \geq arr[j]$
✓