BOYS' HIGH SCHOOL AND COLLEGE
FIRST TERM EXAMINATION (2024-25)
CLASS - X
COMPUTER APPLICATIONS

Estd. 1861

M.M 100

(Two Hours)

This paper is divided into two sections.
*Attempt **all** questions from this **Section A** and any **four** questions from **Section B***

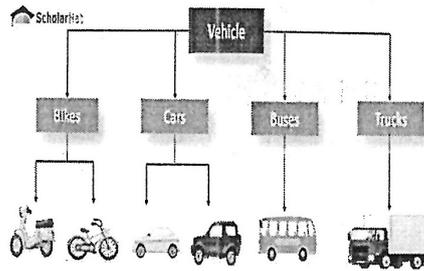## Section A
*(Attempt **all** questions from this Section)*

Question 1 [20]

Choose the correct answer to the questions from the given options.

(Do not copy the questions, write the correct answers only)

1.

Name the principle of OOP depicted in the above picture.
   a. Polymorphism
   b. Inheritance
   c. Encapsulation
   d. Abstraction

2. Which of the following is a user-defined data type:
   a. Integer
   b. Class
   c. String
   d. Scanner

3. Select the valid order of higher precedence to lower precedence of operators:
   a. ++, *, &&, <
   b. ++, *, <, &&
   c. *, <, ++, &&
   d. *, &&, <, ++

4. Which of the following is an escape sequence character in Java?
   a. /n
   b. \t
   c. \z
   d. /f

5. The size boolean data type is:
   a. 1 byte
   b. 1 bit
   c. 8 bits
   d. 0 byte

6. The \u0000 is a default value of _____ data type:
   a. String
   b. char
   c. Character
   d. Integer

7. The automatic type conversion performed by the java complier is known as:

a. Explicit conversion
b. Implicit conversion
c. Forced conversion
d. Type conversion

8. The extension of a Java Byte code file is:
    a. .exe
    b. .class
    c. .doc
    d. .byte

9. Which of the following operator works on single operand?
    a. &&
    b. ++
    c. ||
    d. >=

10. A variable has only one copy for all the objects, is known as:
    a. Class
    b. Static
    c. Instance
    d. Both a and b

11. The type of error due to which the program will not give appropriate output:
    a. Syntax error
    b. Semantic error
    c. Runtime error
    d. Compilation error

12. Method prototype for the method check which accepts two-character arguments and returns true/false:
    a. char check (char ch1, char ch2)
    b. boolean check (char ch1, char ch2)
    c. Boolean check (char ch1, char ch2)
    d. boolean check (char ch1, ch2)

13. The function that terminates the Java Virtual Machine:
    a. System. Exit(0)
    b. System. exit(0)
    c. Exit ( )
    d. Break ( )

14. The Math. round(n) method will return primitive data type_____:
    a. int
    b. long
    c. double
    d. both a and b

15. Method that converts a character to lowercase is_____.
    a. ToLowerCase(char)
    b. toLowerCase(char)
    c. toLowerCase(ch)
    d. toLowerCase( )

16. do… while loop is _____controlled loop but while loop is _____controlled loop.
    a. exit, entry
    b. entry, exit
    c. finite, infinite
    d. definite, indefinite

17. Corresponding wrapper class of char data type is :
    a. Char
    b. Character
    c. isCharacter( )
    d. character

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18. Assertion(A): Polymorphism is one of the features of object-oriented programming Language. It means that a method can be used for multiple purpose. Method overloading is the process of creating different methods with same name but different types and number of parameter list.

Reason(R): To implement the concept of polymorphism, method overloading is used.

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) are true

19 Assertion(A): A constructor is a type of special member method with the same name as of class and used for creating and initializing an object at the time of execution of the program.

Reason(R): Constructor are automatically invoked while creating objects.

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) are true

20. Read the following text and choose the correct answer:

A method is called by passing the value of parameters. In this type of method, the copy of actual parameter is passed to a formal parameter. Any change in the formal parameter does not reflect in the actual parameter.

Name the method?

a. Call by value method

b. Call by reference

c. Impure Method

d. Constructor method

Question 2

1. Evaluate the expression when the value of **a = 4**   [2]

   a+ = a ++ * ++a % 2

2. Write the Java expression for $X = \dfrac{\lfloor A+B \rfloor}{\sqrt{A^2+B^2}}$

3. Rewrite the following do while program segment using for-loop: [2]

```
int m =10; int n=2;
do
{
n++;
m++;
System.out.println( n* m);

} while (m<10);
```

4. Give the output of the following: [2]

   System.out.println(Math. ceil(10.54) + Math. floor(8.64)));

5. Name the types of Boxing in the following program segment.   [2]

   i.   double a=50.98;
   Double b= a;

   ii.   Integer c=213;
   int d=c;

6. Show the output of the following statement: [2]
```
String S1= "123.67";
String S2= "34.89";
double d1=Double.parseDouble(S1);
double d1=Double.parseDouble(S1);
System.out.println(d1+d2);
```

7. Rewrite the following using ternary operator: [2]
```
if ( ch==65)
System.out.println( (char)ch);
else
System.out.println( (char)ch);
```

8. Convert the following if-else-if construct into switch-case. [2]
```
if (var == 1)
System.out.println("Good");
else if (var ==2)
System.out.println("Better");
else if (var ==3)
System.out.println("Best");
else
System.out.println("Invalid");
```

9. Convert the following for loop to while loop and show the output: [2]
```
for( int n=456; n>0; n=n/10)
{
        int rem= n%10
        System.out.println(rem);
}
```

10. Write a method to convert an integer value into String. [2]

Section B
*(Answer any **four** questions from this Section)*
Each program should be written using variable description

Question 3 [15]

The electricity board charges from their consumers according to the units consumed per month. Design a class Electricity with the following specifications:

Class	Electricity
Data Members:	
int consno	to accept consumer number
String name	to accept name of the consumer
int units	to accept unit consumed
double Amt	to store calculated bill amount
Member Functions:	
void Input( )	Input consumer number, name, unit consumed using scanner class
void Calculate( )	calculate the bill amount as per the following criteria:

Unit consumed	Charges
Up to 100 units	₹ 5.50/units
For next 200 units	₹ 6.50/units
For next 300 units	₹ 7.50/units
More than 600 units	₹ 8.50/units

void Display( )	Output details of a consumer
	Consumer Number
	Name of the consumer
	Units consumed

Write the main method to create the object and call the above functions.

Question 4 [15]

Write a program in java to create a class **Wrapper** to perform the following task:

i.   boolean isDigit(int n) check and returns true if n is digit otherwise return false.

ii.   char toUpper(char ch) checks the character ch is lower case and convert it into uppercase and return the converted character else return 0.

Write a main method create the object and call the above functions by passing **actual parameter**

Question 5 [15]

Write a program in Java to input a number to check and display whether a number input by a user is an automorphic number or not (An automorphic number is a number whose square ends with the same digits as the number itself).
Example: 25 is an automorphic as its square 625 and 25 is present as the last two digits.

Question 6 [15]

Design a class to overload a function Series( ) as follows:

void Series(int x, int n) to generate the sum of the series:
$$sum = x^1 + x^2 + x^3 + x^4 + \ldots x^n$$

int Series(int n) to generate and find the sum of the factorials:
$$sum = 1! + 2! + 3! + 4! + \ldots n!$$

double Series(double n, double a) to generate the sum of the series:
$$sum = 2.0/a^{2.0} + 4.0/a^{4.0} + 6.0/a^{6.0} + \ldots n/a^n$$

Question 7 [15]

Write a program in java to create a class **Pattern** to display the following pattern using nested for loops:

i.

```
1
3 1
5 3 1
7 5 3 1
9 7 5 3 1
```

ii.

```
@
@#
@#@
@#@#
@#@#@
```

Question 8 [15]

Write a program in Java to accept the string and display:
i.   The number of upper-case characters
ii.   The number of lower-case characters
iii.   The number of digits
iv.   The number of special characters
Using Wrapper class functions only.

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