St. Mary's Convent Inter College , Prayagraj
First Terminal Examination 2024

Time: 2hrs   Class - 10   M.M :100
                          Computer Applications

Name .... Roll No......................... Date ....

_____

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(40 marks)
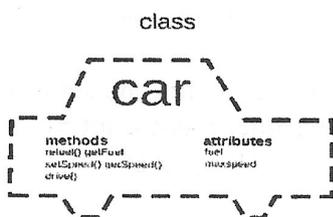
(Attempt all questions from this Section.)

Question 1:   [20×1=20]
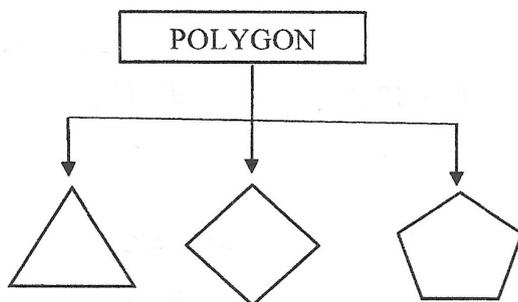
Choose the correct answers to the questions from the given options. (Do not copy the question, write the correct answers only.)

i)   What does the following diagram depict:

    a) Modularity
    b) Polymorphism
    c) Encapsulation
    d) Inheritance

ii)   Consider the picture and choose the correct statement from the following:

    a) Polygon is the object and the pictures are classes
    b) Both polygon and the pictures are classes
    c) Polygon is the class and the pictures are objects
    d) Both polygon and the pictures are objects

iii)   int x = 98; char ch = (char)x; what is the value in ch?
    a) B   b) A   c) 97   d) b

iv)   Which of the following is an escape sequence character in Java?
    a) /n   b) \t   c) /t   d) //n

v)   The extension of a Java source code file is:
    a) obj   b) jvm   c) java   d) exe

vi)   Which of the following data type cannot be used with switch case construct?
    a) int   b) char   c) String   d) double

vii)   Method which reverses a given number is:
    a) Destructor   b) Constructor   c) Impure Method   d) Pure Method

viii) Invoking a method by passing the objects of a class is termed as:
    a) Call by reference   b) Call by value   c) Call by object   d) Call by constructor

ix) Assertion (A): Static method can access static and instance variables.

Reason (R): Static variable can be accessed only by static method.
a) Assertion and Reason both are correct.
b) Assertion is true and Reason is false.
c) Assertion is false and Reason is true.
d) Assertion and Reason both are false.

x) Assertion (A): An argument is a value that is passed to a method when it is called.

Reason (R) : Variables which are declared in a method prototype to receive values are called actual parameters
a) Both Assertion A and Reason R are true and Reason R is the correct explanation of the Assertion A
b) Both Assertion A and Reason R are true and Reason R is not the correct explanation of the Assertion A
c) Assertion A is true and Reason R is false
d) Assertion A is false and Reason R is true

xi) To execute a loop 10 times, which of the following is correct?
  a) for(int i=11; i<=30 ; i+=2)   b) for(int i=11 ; i<=30 ; i+=3)
  c) for(int i=11 ; i<20 ; i++)   d) for(int i=11 ; 1<=21 ; i++)

xii) The prototype for the method compute which accepts two integer arguments and returns true/false
  a) void compute(int a, int b)   b) boolean compute(int a, int b)
  c) Boolean compute(int a, b)   d) int compute(int a, int b)

xiii) Select the output for the code :

for(x = 7 ; x < =10 ; ++x) ;

System.out.print(x +" _");

  a) 7_8_9_10_11_   b) 8_9_10_   c) 8_9_10_11_   d) 11_

xiv) Select the output of the following code :

System.out.println(Math.abs(Math.ceil(-7.5) + Math.sqrt(25.0) – Math.max(3,8)));

  a) 9.0   b) 10.0   c) -11.0   d) 11.0

xv) State the output of the following if st = 'D' :

switch(st)

{

default : System.out.print("Grade Unknown");

case 'A' : System.out.print("Grade A"); break;

case 'B' : System.out.print("Grade B"); break;

case 'C' : System.out.print("Grade C"); break;

}

  a) None of the below   b) Grade AGrade B
  c) Grade BGrade C   d) Grade UnknownGrade A

xvi) Select the pattern that will be printed by the following code :

for(int x = 1; x<= 5; x++)

{   for(int y =1 ; y <= 5 ; y++)

{   if (.x = = y | | (x + y) = = 6)

```
            System.out.print("%");

        else

            System.out.print("   ");

    }

    System.out.println( );

}
```

i)   % % % % %

      % % % %

        % % %

          % %

            %

ii)   %   %

       %   %

         %

       %   %

      %   %

iii)   % % % % %

      % % % %

       % % %

        % %

         %

iv) % % % % %

  %   %

  %   %

  %   %

  % % % % %

xvii) Consider the following program segment in which the statements are jumbled, choose the correct order of statements to swap two variables using a third variable.

```
int a = 12, b = 34;
a = b ; →( 1 )
b = t; →( 2 )
int t = 0; →( 3 )
t = a; → ( 4 )
```

    a) (1) (2) (3) (4)
    c) (1) (3) (4) (2)
    b) (3) (4) (1) (2)
    d) (2) (1) (4) (3)

xviii) Which of the following are entry-controlled loops?
    1. for   2. while   3. do-while   4. switch
    a) Only 1   b) 1 and 2   c) 1 and 3   d) 3 and 4

xix) Operators with higher precedence are evaluated before operators with relatively lower precedence. Arrange the operators given below in order of higher precedence to lower precedence.
    1. &&   2. %   3. >=   4. ++

    a) 4, 1, 3, 2   b) 4, 3, 2, 1   c) 4, 2, 3, 1   d) 1,2, 3, 4

xx) The statement that brings the control back to the calling method is :
    a) break   b) System.exit(0)   c) Continue   d) return

Question 2   [2]

i) Consider the given program and answer the questions given below:

```
class temp
{  int a;
   temp()
   {a=10; }
   temp(int z)
   {a=z; }
```

```java
        void print()
        { System.out.println(a); }
        public static void main(String args[ ])
         { temp t = new temp();
           temp x = new temp(30);
           t.print();
           x.print();
         } }
```

(a) What concept of OOPs is depicted in the above program with two constructors?

(b) What is the output of the method main()

ii)   Give the output of the following program segment. How many times is the loop executed?   [2]
```java
for(x=10; x>20;x++)
System.out.println(x);
System.out.println(x*2);
```

iii)   Convert the following if else if construct into switch case: [2]
```java
if (ch== 'c' || ch=='C')
System.out . print("COMPUTER");
else if (ch== 'h' || ch=='H')
System.out . print("HINDI");
else
System.out . print("PHYSICAL EDUCATION");
```

iv)   Name the keyword which: [2]
   a) Indicates that a method has no return type.
   b) Makes the variable as a class variable.

v)   Rewrite the following using single if statement: [2]
```java
if( code == 'g')
System.out.println("GREEN");
else if(code == 'G')
System.out.println("GREEN");
```

vi)   Evaluate the given expression when the value of a=2 and b=3:   [2]
```java
b *= a++ - ++b + ++a;
System.out.println("a="+a+" b="+b);
```

vii)   Write a java expression for the following: $\sqrt[3]{x} + \sqrt{y}$ [2]

viii)   Consider the following code and answer the questions that follow:
```java
class record
{ static int m, n;  int z;
  public static void show( )
  {    m = 31 ; n = 25 ;
     System.out.println( m+n );
  }
  public void display( )
  { int h = 27 ;
    record bat = new record( );
} }
```

   a)   Name the class variable, local variable and instance variables?   [3]
   b)   Write a statement to invoke the function show( ).   [2]
   c)   Name the object of the class record.   [1]

Attempt any four questions from this section. A description of variables will be required with every program attempted.

Question 3 [15]

Design a class RailwayTicket with following description:

Instance variables/data members :

String name : To store the name of the customer

String coach : To store the type of coach customer wants to travel

long mobno : To store customer's mobile number

int amt : To store basic amount of ticket

int totalamt : To store the amount to be paid after updating the original amount

Member methods :

RailwayTicket() : constructor to initialise data members

void accept () – To take input for name, coach, mobile number and amount.

void update() – To update the amount as per the coach selected (extra amount to be added in the amount as follows)

Type of Coaches	Amount(Rs)
First AC	700
Second AC	500
Third AC	250
Sleeper	None

void display() – To display all details of a customer such as name, coach, total amount and mobile number. Write a main method to create an object of the class and call the above member methods.

Question 4 [15]

A private Cab service company provides service within the city at the following rates:

	AC CAR	NON AC CAR
UPTO 5 KM	₹ 150 /-	₹ 120 /-
BEYOND 5 KM	₹ 10/-PER KM	₹ 08/- PER KM

Design a class CabService with the following description:

Member variables /data members:

String car_type - To store the type of car (AC or NON AC)

double km - To store the kilometer travelled

double bill - To calculate and store the bill amount

Member methods :

CabService( ) - Default constructor to initialize data members. String data members to " " and double data members to 0.0.

CabService(String ct, double k) – Parameterised constructor to assign values to car_type and km.

void calculate ( ) - To calculate the bill as per the rules given above.

void display( ) - To display the bill as per the following format:

    CAR TYPE:

    KILOMETER TRAVELLED:

    TOTAL BILL:

Create an object of the class in the main( ) method and invoke the member methods.

Question 5: [15]

A Super Spy number is one the sum of whose digits equals the number of digits.

For Example : Input : 1021

    Output: Super Spy number

Since the sum of the digits = 1+0+2+1 =4 which is equal to the number of digits.

Write a program to input M and N such that M<N and find all the Super Spy numbers between them.

Question 6

Design a class to overload a method Number( ) as follows:

(i) void Number (int num , int d) - To count and display the frequency of a digit in a number.
Example: num = 2565685 d = 5 Frequency of digit 5 = 3

(ii) void Number (int n1) - To find and display the sum of even digits of a number.
Example: n1 = 29865 Sum of even digits = 16

Write a main method to create an object and invoke the above methods

Question 7

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

a) void polygon( ) – Prints a row of 10 stars(*)
b) void polygon(int x) – Prints a row of 'x' stars.
c) void polygon (int m, char ch) – Prints a row having the character ch, 'm' times

Create a main() to print the following pattern:

```
**********

A
BB
CCC
DDDD
******
```

Question 8

Write a menu driven program to perform the following operations as per user's choice:

(i) To print the value of $c=a^2+2ab$, where 'a' varies from 1.0 to 20.0 with increment of 2.0 and b=3.0 is a constant.

(ii) To display the following pattern using nested for loop:

```
0 0 0 0 0
0 1 1 1 0
0 1 2 1 0
0 1 1 1 0
0 0 0 0 0
```

Display proper message for an invalid choice.

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