

Maximum Marks: 100

Time Allowed: Two Hours

Answers to this Paper must be written on the paper provided separately.

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

Choose the correct answer and write the correct option.

[20]

- (i) If the name of a class is 'Number', what can be the possible name for its constructor?
(a) number (b) Number (c) No (d) No
- (ii) How many parameters does a default constructor require?
(a) 3 (b) 0 (c) 2 (d) 1
- (iii) The default access specifier for a method of a class is
(a) private (b) public (c) protected (d) package
- (iv) The function that modifies its parameters is called a –
(a) Virtual function (b) Pure function (c) Impure function (d) Default function
- (v) Which of the following is not applicable for a constructor function?
(a) It has the same name as the class.
(b) It has no return-type
(c) It is usually used for initialisation.
 (d) It can be invoked using an object like any other member function.
- (vi) The wrapping up of data and methods together as one unit is called:
(a) Inheritance (b) Polymorphism (c) Encapsulation (d) None of the above
- (vii) The method to convert a string to upper case is -
 (a) toUpperCase(String) (b) toUpperCase(char) (c) to UPPERCASE(String)
- (viii) The access modifier that gives most accessibility is:
(a) private (b) public (c) protected (d) package
- (ix) Which function in Java removes the leading and trailing whitespaces from the string?
(a) proper (b) prim (c) remove (d) trim

(x) The statement to invoke the default constructor of a class "State" is -

- (a) State obj=new State
(b) State obj= State()
(c) State obj=new State()
(d) State obj=new State (10, 5)

(xi) Which among the following is valid character initialisation?

- (a) Character c=new Character('c');
(b) Character c=new Character("c");
(c) Both a and b
(d) None of these

(xii) What is converting a primitive value into an object of the corresponding wrapper class called?

- (a) Autoboxing
(b) Unboxing
(c) Type Casting
(d) All of these

(xiii) The number of values that a function can return are:

- (a) 0
(b) 1
(c) 2
(d) 3

(xiv) Given the code:

```
int change (int p, int q)
{
    p = p * q;
    return p;
}
```

The statement to call the above function will be:

- (a) change (10,20) (b) change (9.5,10.5) (c) int r=change (10,20) (d) none of the above

(xv) Output of Math.ceil(46.6) is -

- (a) 46.5 (b) 46.6 (c) 46.0 (d) 47.0

(xvi) What is the final value stored in variable c?

```
double a = -6.52;
double b = -14.74;
int c = (int) Math.round(Math.max(a,b));
```

- (a) -6 (b) -6.0 (c) -7 (d) -7.0

(xvii) The output of the method "Computer Application". substring (2,8) is:

- (a) Application (b) Computer (c) puter A (d) mputer

(xviii) Math.pow (625,1/2) +Math.sqrt(144)

- (a) 17.0 (b) 13.0 (c) 37.0 (d) 13

(xix) The output of Double.parseDouble("71.25") + 0.75 is :

- (a) 72 (b) 72.0 (c) 71 (d) 71.0

(xx) What will be the output of the following program code?

```
char opn = 'b';
switch(opn)
{
    case 'a': System.out.println("Platform independent");
        break;
    case 'b': System.out.print("Object oriented");
    case 'c': System.out.print("Robust and secure");
    default: System.out.print("Wrong output");
}
```

- (a) Object oriented
(b) Object orientedRobust and secure
(c) Object orientedRobust and secureWrong output

Question 2.

- (i) Why is a class known as composite data type?
- (ii) State two differences between equals() and compareTo().
- (iii) Write the return type of the following functions:
 - a. isLetterOrDigit (char)
 - b. replace (char, char)

(iv) Write the Java expression for -

$$\frac{\sqrt[3]{5x^2}}{x + y^3}$$

(v) Consider the following class:

```
public class Ticket
{
    public int x = 10, y = 20;
    public static int a = 45, b = 32;
}
```

- a. Name the variable(s) for which each object of the class will have its own distinct copy.
- b. Name the variable(s) that are common to all the objects of the class.

(vi) Convert the following do-while () loop to its corresponding for loop:

```
inti = 1, d = 5;
do
{
    d = d * 2;
    System.out.println(d);
} while(i <= 5);
```

(vii) What will the value of x be after execution if x = 8 initially?

```
x + = x++ + x + ++x --x + x-- + 10
```

(viii) Write the values stored in the variables for the following java segments:

- a. String s = "Application".substring(7,11);
- b. int indx = "Coconut".indexOf("o");
- c. String c = "Computer".charAt(0)+"Application".charAt(0);
- d. Boolean b = "Upper".isUpperCase();

(ix) State the output of the following program code segment:

```
int a[4] = {2, 4, 6, 8};
for(i = 0 ; i < a.length ; i++)
{
    s = a[i] * a[3-i];
    System.out.println(s);
}
```

(x) What will be the final value of c when the following program code executes?

```
int c = 0;
for (int i = 1 ; i <= 5 ; i++)
{
    for (int j = 1 ; j <= 5 ; j = j + 2)
    {
        c = c + 1;
    }
}
```

SECTION B (60 Marks)

Attempt *any four* questions from this Section.

The answers in this Section should consist of the Programs in either Blue J environment or any program environment with Java as the base.
Each program should be written using Variable descriptions/Mnemonic Codes so that the logic of the program is clearly depicted.
Flow-Charts and Algorithms are not required.

[15]

Question 3

Define a class taximeter having the following description:

Data members/instance variables:

int taxino - to store taxi number

String name - to store passenger's name

int km - to store number of kilometres travelled

Member functions:

taximeter() - constructor to initialize taxino to 0, name to "" and b to 0.

input() - to accept taxino, name, km

calculate() - to calculate bill for a customer according to given conditions

Kilometers travelled (km)	Rate/km
≤ 1 km	Rs 25
$1 < km \leq 6$	Rs 20
$6 < km \leq 12$	Rs 15
> 12 km	Rs 10

display() - To display the details in the following format

Taxino	Name	Kilometres travelled	Bill amount
---	---	---	---

Create an object in the main method and call all the above methods in it.

[15]

Question 4

Write a program to accept a sentence and print only the first letter of each word of the sentence in capital letters.

[15]

Question 5

Write a program to print the largest and smallest element of an array storing 10 integers entered by the user.

[15]

Question 6

Write a menu driven program to perform the following operations:

- To input a number and print if it is a palindrome number or not.
- To input a number and print the product of first and last digit of the number

[15]

Question 7

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

- void SumSeries (int n, double x) – with one integer argument and one double argument to find

and display the sum of the given series:

$$S = \frac{x}{1} - \frac{x}{2} + \frac{x}{3} - \frac{x}{4} + \frac{x}{5} \dots n \text{ terms}$$

- void SumSeries () – to display the sum of the given series:

$$S = 1 + x^2 + x^3 + x^4 + \dots + x^{10}$$