Question 1.

Choose the correct answers to the questions from the given options. (Do not copy the question. Write the correct answer only.) *[1 x 20=20]*

(i) Which method is used to check the equality of two strings?

(a) compare( )

(b) equalsTo( )

(c) equals( )

(d) Stringcompare( )

(ii) Which of the following is mutable data type?

(a) String

(b) StringBuffer

(c) char

(d) boolean

(iii) A single dimensional array in java is also called a :

(a) matrix

(b) table

(c) linear array

(d) nested array

(iv) Which of the following is NOT a fundamental principle of OOP in Java?

(a) Encapsulation

(b) Inheritance

(c) Compilation

(d) Polymorphism

(v) Give the output of the following code:

System.out.println(1+ '1' + " 1");

(a) 501

(b) 111

(c) 1'1'1

(d) 491

(vi)System.out.println( ) is a _____ method.
(a) computational method
(b) manipulative method
(c) procedural method
(d) both a and b option

(vii) The access modifier that gives least accessibility is
(a) private
(b) public
(c) protected
(d) friendly

(viii) Which of the following is NOT a valid string function
(a) trim()
(b) substring()
(c) concat()
(d) equal()

(ix) Assertion(A):
String objects in java are immutable.
Reason (R) :
Because every time a string is modified, a new String object is created instead of changing the existing one.
(a)A and R both are true, and R is the correct explanation of A.
(b) A and R both are true, but R is not the correct explanation .
(c) A is true but R is false.
(d) A is false but R is true.

(x) Assertion(A):
Data hiding is an important feature of OOP.
Reason (R) :
Data hiding is achieved by using private access specifiers..
(a)A and R both are true, and R is the correct explanation of A.
(b) A and R both are true, but R is not the correct explanation .
(c) A is true but R is false.
(d) A is false but R is true.

(xi) A function's argument list is also known as ___
(a) function's signature.
(b) function definition
(c) function overloading
(d) method overloading

(xii) _____ variable is declared inside a block and cannot be accessed outside the block.
(a) instance
(b) global
(c) local
(d) static

(xiii) Members with access specifier as _____ can be used only within the class i.e. within the member methods of the class.
(a) public
(b) default
(c) private
(d) protected

(xiv) package access means
(a) members are accessible to all classes within a program.
(b) members are accessible to all classes within a package.
(c) members are accessible to their own class.
(d) none of the above

(xv) A class containing main method cannot be termed as
(a) driver class
(b) user defined data type
(c) none of the above
(d) all of the above

(xvi)What happens in the given codes:
Integer java = 50;
int j= java;
(a) Auto boxing
(b) unboxing
(c) compile time error
(d) run time error

(xvii) Parameters used in method call statement are _____
(a) formal parameters
(b) actual parameters
(c) Informal parameters
(d) void parameters

xviii) Which declaration correctly represents a 2D array of 3 rows and 4 columns?
(a) int a[3,4];
(b) int a[ ] [ ] = new int[3] [4];
(c) int a[ ] [ ] = new int[4] [3];
(d) int a[ ] = new int[3] [4];

xix) An array is declared as: float price[ ] =new float [7]; What is the total number of floating point values it can store ?
(a) 8
(b) 7
(c) 28
(d) 56

xx) the ***this*** keyword in java is used to :
(a) call a super class method
(b) refer to the current object
(c) handle errors
(d) terminates the program

viii. int[ ][ ] matrix = {{1, 2, 3}, {4, 5}};

```
int total = 0;
    for (int i = 0; i < matrix.length; i++)
    {
      for (int j = 0; j < matrix[i].length; j++)
      {
        total += matrix[i][j];
      }
    }
    System.out.println("Total Sum: " + total);
```

ix. Give the output:

```
System.out.println(Math.ceil( -8.3));
System.out.println(Math.abs(Math.pow(2,1/2) - Math.sqrt(81) ));
```

x. Give the output for each of the following statements:

```
String D = "AASVOGEL", d = " AARDWOLF";
System.out.println(d.compareTo(D));
System.out.println("D".compareTo("d"));
```

SECTION B

*(Answer **any four** questions from this Section)*

The answers in this section should consist of programs in either Blue J environment or 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 program to create a 4 x 4 integer array. Input the elements in the array. Perform the given tasks:-

i. Display the primary diagonal elements. Display the largest element in the primary diagonal.
ii. Display the secondary diagonal elements. Display the smallest element in the secondary diagonal.
iii. Display the sum of all the left and right diagonal elements.

Question 4. [15]

Define a class with the following specifications:

Class name: Bank

Member variables:

double p — stores the principal amount

double n — stores the time period in years

double r — stores the rate of interest

double a — stores the amount

Member methods:

void accept () — input values for p and n using Scanner class methods.

void calculate () — calculate the amount based on the following conditions:

Question 2. [2x10=20]

i. Predict the output of the following program code-

```
for (char ch = 'A'; ch <= 'C'; ch++)
{
        for (int i = 1; i <= 2; i++)
        {
          System.out.print((char)(ch + i) + " ");
        }
        System.out.println( );
}
```

ii. Give the output of the following code:

```
String A = "100.5", B = "94.0";
double C = Double.parseDouble(A);
double D = Double.parseDouble(B);
System.out.println(C+D);
System.out.println(A+B);
```

iii. What will be the output of the following code?

```
System.out.println("Loyola jsr".substring(4,3));
System.out.println("Loyola jsr".substring(1));
```

iv. Give the output of the following String methods:

```
"bazaar".indexOf('a') + "karaoke".lastIndexOf('a');
```

v. Write the output for the following statements –

```
String S = "Aardwolf";
System.out.println( Character.toUpperCase(S.charAt(2)) );
System.out.println ( S.charAt (3) > S.charAt(S.length( )-2) ) ;
```

vi. Predict the output for the following code snippet –

```
int x=0;
do
{       if(x<3)
        {       x+=2;
                System.out.println(x);
                continue;
        }
        else
        {       System.out.println(++x);
                break;
        }
}while(x<10);
```

vii. Rewrite the following code using switch….case statement:

```
char c;
if(c == '*')
System.out.println('0' + 1);
else if(c == '$')
System.out.println('1'+5);
else
System.out.println('2' + 10);
```

Time in (Years)	Rate %
Upto 1/2	9
> 1/2 to 1 year	10
> 1 to 3 years	11
> 3 years	12

[Use the **formula** to calculate the amount as $a = p(1 + \frac{r}{100})^n$]

void display () — display the details in the given format.

Principal	Time	Rate	Amount
XXX	XXX	XXX	XXX

Write the **main method** to create an object and call the above methods.

Question 5. [15]

Write a program to input a sentence and display the word of the sentence that contains maximum number of vowels.

Sample Input: HAPPY NEW YEAR

Sample Output: The word with maximum number of vowels: YEAR

Question 6. [15]

Write a program in java to create a string array TR[ ] and numeric array NT [ ] of size 10 to accept name of 10 national parks and number of tourists visiting in a year in thousands respectively. Display the name of the national parks along with the number of tourists in descending order of the number of tourists. Use selection sort technique to sort the array in descending order. Print the name of those national parks where the most and least number of tourists went .

Question 7. [15]

A string is said to be 'Unique' if none of the letters present in the string are repeated. Write a program to accept a string and check whether the string is Unique or not. The program displays a message accordingly.

Sample Input: NUMBER

Sample Output: Unique String

Question 8. [15]

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

(i) void display(int n): to display the product of the successors of even digits of the number ***n*** (integer argument)

Input: 2745

Output: 15

[Hint: The even digits are: 2 and 4

The product of successor of even digits is: 3*5= 15]

(ii) void display( ): to find and display the sum of the following series:

$1 + (1\times2)/4 + (1\times2\times3)/27 + (1\times2\times3\times4)/256 + \ldots\ldots + (1\times2\times3\times4\times5\times6\times7\times 8\times9\times10)/10^{10}$

Write a main() method to input the required data and call above functions.