Sample Question Paper-1

(Specimen Paper issued by CISCE dated 12 th July 2022)

COMPUTER APPLICATIONS

Class-10th

SOLVED

Time Allowed: 2 hours **Maximum Marks: 100**

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 [1 Mark each]

*(Attempt **all** questions from this **section**)*

Q. 1. Choose the correct answer and write the correct option:

(i) Wrapping up of data and methods together as one unit is termed as:
(a) Inheritance **(b)** Polymorphism
(c) Encapsulation **(d)** Abstraction

(ii) The datatype which is specified that the method does not return a value is:
(a) Void **(b)** void
(c) VOID **(d)** boolean

(iii) The logical operation which is an unary operator:
(a) && **(b)** ||
(c) ! **(d)** >>

(iv) The Scanner class is a _____ class.
(a) Primitive **(b)** Derived
(c) Wrapper **(d)** super class

(v) Math.pow (625, ½) + Math.sqrt(144)
(a) 17.0 **(b)** 13.0
(c) 37.0 **(d)** 13

(vi) The correct if statement for the following ternary operation statement is:

```
System.out.println(n%2==0? "true":"false");
```

(a)
```
if(n%2==0)
return true;
else
return false;
```

(b)
```
if(n%2==0)
return "true";
else
return "false";
```

(c)
```
if(n%2==0)
System.out.println("true");
else
System.out.println("false");
```

(d)
```
if(n%2==0)
return false;
else
return false;
```

(vii) Multiple branching statement of java is:
(a) For **(b)** while
(c) do… while **(d)** switch

(viii) The number of bytes occupied by the constant 45 are:
(a) Four bytes **(b)** two bytes
(c) Eight bytes **(d)** one byte

(ix) do…..while loop is an
(a) entry controlled loop **(b)** infinite loop
(c) exit controlled loop **(d)** Finite loop

(x)
```
for(k=1;k<=2;k++)
{  for(m=1;m<=4;m++)
   { System.out.println(m*2);
   }
}
```
How many times the inner loop is executed?
(a) 4 times **(b)** 8 times
(c) 2 times **(d)** 16 times

(xi) A method with the same name as of the class and with arguments and no return data type is termed as:
(a) parameterized constructor **(b)** default constructor
(c) Non-parameterized constructor **(d)** wrapper class method

(xii) int res='A'; What is the value of res?
(a) A **(b)** 66
(c) 65 **(d)** 97

(xiii) The style of expressing single line comment is:
(a) /* comment*/ **(b)** * comment
(c) // comment **(d)** /* comment

(xiv) The method of check if a character is an alphabet or not is:
(a) isLetter(char) **(b)** isAlpha(char)
(c) isUppercase(char) **(d)** isLowercase(char)

(xv) The output of Double.parseDouble("71.25")+0.75 is:
(a) 72 **(b)** 72.0
(c) 71.0 **(d)** 71.75

(xvi) The method to convert a string to upper case is:
(a) toUpperCase(char) **(b)** toUPPERCASE(String)
(c) toUpperCase(String) **(d)** touppercase(String)

(xvii) The output of the method "DETERMINATION".substring(2, 6) is:
(a) "TERM" **(b)** term
(c) "Term" **(d)** "TERMI"

(xviii) The array int x[10] occupies:
(a) 10 bytes **(b)** 40 bytes
(c) 20 bytes **(d)** 80 bytes

(xix) The element in x[4] of the array {3, 5, 7, 12, 16, 18, 20, 35, 42, 89} is:
(a) 16 **(b)** 12
(c) 7 **(d)** 18

(xx) Name the type of error that occurs for the following statement:
```
System.out.println(Math.sqrt(24 - 25));
```
(a) Syntax error **(b)** run time error
(c) logical error **(d)** no error

Question 2.

(i) Evaluate the expression: **[2]**
z += a++ +--b+ ++a +--b;
where a = 10, b = 5, z =10

(ii) Write java expression for: $|x^2 + xy|$ **[2]**

(iii) Rewrite the following using ternary operators: **[2]**
```
if (x > y)
   c = 'A';
else
   c = 'a';
```

(iv) Rewrite the following while loop using for loop: **[2]**
```
int x = 5;
while (x<= 5)
```

```
{
   x++;
}
System.out.println(x);
```

(v) How many times the following loop will gets executed? What is the output of the same? **[2]**

```
int counter=1,
do
{
   System.out.println(counter);
} while (counter ++ <5 );
```

(vi) ."MISSISSIPPI".replace('S', 't').toLowerCase() **[2]**

(vii) "REDUCE".compareTo("REVOLT") – "ANTARTICA".lastIndexOf('A') **[2]**

(viii) Define boxing with an example. AI **[2]**

(ix) Consider the following program and answer the questions given below: **[2]**

```
class sample
{  int a, b;
   sample(int x, int y)
   { a = x; b = y;
   }
   void calculate()
   { int z;
     z = a+b;
     System.out.println(z);
   }
}
```

(a) Name the global variables.

(b) What are the method variables?

(x) Consider the following array and answer the questions given below: **[2]**

int x [ ] = {23, 45, 67, 12, 45, 89, 24, 12, 9, 7}

(a) What is the size of the array?

(b) What is the position of 89?

SECTION-B [15 Marks each]

*(Answer **any four** questions from this section.)*

The answers in this section should consist of the programs in either BlueJ 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.

Flow charts and algorithms are not required.

Question 3. **[15]**

Define a class with the following specifications:

Class name:	employee
Member variables:	eno – employee number
	ename – name of the employee
	age – age of the employee
	basic – basic salary

[Declare the variables using appropriate data types]

Member methods:

void accept()–	accept the details using scanner class
void calculate ()–	to calculate the net salary as per the given specifications:
	net = basic + hra + da – pf
	hra = 18.5% of basic
	da = 17.45% of basic
	pf = 8.10% of basic
	if the age of the employee is above 50 he/she gets an additional allowance of Rs. 5000.
void print() –	to print the details as per the following format eno ename age , basic net
void main() –	to create an object of the class and invoke the methods

Question 4. **[15]**

Define a class to overload the method print as follows:

void print () – to print the format
1
2 3
4 5 6
7 8 9 10

boolean print (int n) – to check whether the number is a Dudeney number, a number is Dudeney if the cube of the sum of the digit is equal to the number itself.
Eg: 512 = (5 + 1 + 2) 3 = (8) 3 = 512

void print (int a, char ch) – if ch = s or S print the square of the number else if ch = c or C print the cube of the number.

Question 5. AI **[15]**

Define a class to accept 10 integers and arrange them in descending order using bubble sort. Print the original array and the sorted array.

Question 6. **[15]**

Define a class to accept values into a double array of size 20 and print the range of the array, range is the difference between the largest and the smallest elements of the array.

Question 7. **[15]**

Define a class to accept a string and print the same in reverse, also print the number of vowels in the string.
Eg: S = "BEAUTIFUL"
Output – "LUFITUAEB"
No. of vowels = 5

Question 8. **[15]**

Define a class to accept the names of 10 students in an array and check for the existence of the given name in the array using linear search, if found print the position of the name, if not found print the appropriate message. Also print the names which begins with the word "SRI".

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SOLUTIONS

Sample Question Paper-1

COMPUTER APPLICATIONS

SECTION-A

1. (i) Option (c) is correct.
Explanation: Encapsulation is a concept of OOPS that states that data and associated methods can be bound together as one unit in a class.

(ii) Option (b) is correct.
Explanation: The void data type means nothing or none. When a method does not return any value , its return type is void.

(iii) Option (c) is correct.
Explanation: The logical operator not (!) takes only a single operand and returns its reverse.

(iv) Option (b) is correct.
Explanation: The Scanner class is a Derived class used to input data of various primitive types using methods like nextInt(), nextLine() etc.

(v) Option (b) is correct.
Explanation: Math.pow() returns the power of a number raised to an exponent. Hence Math.pow(625,1/2) Return 1.0. Math.sqrt() returns square root of a number. Hence Math.sqrt(144) returns 12.0. Therefore: 25.0 +12.0 = 37.0

(vi) Option (c) is correct.
Explanation: In the ternary operation if n%2 ==0, true is printed otherwise false is printed. The same structure is shown in the if…else block of option (c)

(vii) Option (d) is correct.
Explanation: The switch…case block in java allows to implement multiple conditions and their branching.

(viii) Option (a) is correct.
Explanation: Integers in java occupy 4 bytes. Since 45 is an integer, it occupies 4 bytes

(ix) Option (c) is correct.
Explanation: The loop condition is checked at the end of the loop in a do…while loop. Hence it is an exit controlled loop.

(x) Option (a) is correct.
Explanation: The loop structure is m=1;m<=4;m++. Hence m will iterate through values 1, 2, 3, 4. Hence the loop executes for 4 times.

(xi) Option (a) is correct.
Explanation: A parameterised constructor is a type of constructor that initialises the data members by the arguments received. Since constructors have same name as class and they return no values hence the parameterised constructors also do not return any values.

(xii) Option (c) is correct.
Explanation: The ASCII code of 'A' is 65. Hence res will store 65.

(xiii) Option (c) is correct.
Explanation: Single line comments are expressed using // in java.

(xiv) Option (a) is correct.
Explanation: The isLetter() function checks whether the argument received is an alphabet or not and returns a boolean true/false.

(xv) Option (b) is correct.
Explanation: The Double.parseDouble() converts the string "71.25" to 71.25 + 0.75 gives 72.0

(xvi) Option (c) is correct.
Explanation: The toUpperCase() function converts a string to uppercase.

(xvii) Option (a) is correct.
Explanation: The substring(2, 6) function call returns characters from index 2 to 5. Hence the string "TERM" is returned.

(xviii) Option (b) is correct.
Explanation: Since an integer occupies 4 bytes, an array with 10 elements will occupy 40 bytes.

(xix) Option (a) is correct.
Explanation: The indexing in java starts from 0, hence x[4] means element at position 5, which is 16.

(xx) Option (d) is correct.
Explanation: The above statement returns a NaN. Since Math.sqrt(-1) is imaginary , it returns a NaN. Hence no error.

2. (i) 39
Explanation: z+ = a++ + --b + ++a + --b;
z = 10 + 10 + 4 + 12 + 3
z = 39

(ii) `Math.abs(x*x + x*y)`

(iii) c= (x>y)? 'A': 'a';

(iv) for(int x=5;x<=5;x++);
System.out.println(x);

(v) 5 times
Output
1
2
3
4
5
Explanation: The loop is an exit-controlled loop. The loop variable counter is post decremented and the condition is checked at the end. Hence the loop executes for values of counter = 1, 2, 3, 4, 5.

(vi) mittittippi
Explanation: The replace() function replaces all occurances of 'S' by 't' and then converts the whole string to lowercase.

(vii) –18 – 8 = –26
Explanation: "REDUCE".compareTo ("REVOLT") compares the two strings and returns the differences between the ASCII codes of differing character. "ANTARTICA". lastIndexOf('A') returns the index of the last occurrence of 'A' in the string

(viii) Autoboxing is the automatic conversion that the Java compiler makes between the primitive types and their corresponding object wrapper classes. For example, converting an int to an Integer, a double to a Double, and so on. If the conversion goes the other way, this is called unboxing.

(ix) **(a)** Global variables: a and b.
(b) int x, int y, int z
Explanation: Global variables are the ones declared outside all methods. Method variables are the ones declared inside methods.

(x) **(a)** Since there are 10 elements the size of the array is 10.
(b) The position of 89 is 5, since indexes in java starts from 0.

SECTION-B

3.
```
import java.util.Scanner;
public class Employee
{
  private int eno;
  private String ename;
  private int age;
  private double net;
  private double basic;

  public void accept() {
    Scanner in = new
    Scanner(System.in);
    System.out.print("Enter employee
    number: ");
    eno = in.nextInt();
    System.out.print("Enter Name: ");
    ename =
    in.nextLine();
    System.out.print("Enter
    employee age: ");
    age = in.nextInt();
    System.out.print("Enter basic
    salary: ");
    basic = in.nextDouble();
  }
  public void calculate() {
    double hra,da,pf;
    hra=(basic*18.5)/100;
    da=(basic*17.45)/100;
    pf=(basic*8.10)/100;
    net=basic+da+hra-pf;
  }
  public void print() {
    System.out.println("Employee
    Number\tName\tAge\tBasic\tNet\n");
    System.out.println(eno + "\t" +
    ename + "\t" + age +"\t" + basic +
    "\t" + net);
  }
  public static void main(String
  args[]) {
    Employee obj = new Employee();
    obj.accept();
    obj.calculate();
    obj.print();
  }
}
```

Commonly Made Error

- Most of the candidates answered this question correctly. Some candidates get confused with Syntax errors in the object creation and function call statement.

Answering Tip

- Students should learn all the concepts to write syntax and calling function properly.

4.
```
import java.util.Scanner;
public class ProgOptionsNumber
{
  public static void main(String
  args[])
{ Scanner in = new Scanner(System.in);
  System.out.print("1.Print Pattern
  ");
  System.out.print("2.Check Dudeney
  Number ");
  System.out.print("3.Print Square /
  Cube ");
  System.out.print("Enter your
  choice:");
  int ch = in.nextInt();
  if (ch==1)
  {
```

```
    print();
  }
  else if(ch==2)
  {
    System.out.print("Enter number:");
    int n=in.nextInt();
    print(n);
  }
  else if(ch==3)
  {
    System.out.print("Enter number:");
    int n=in.nextInt();
    System.out.print("Enter
    character(S-Square/C-Cube):");
    char ch=in.nextLine().charAt(0);
    print(n,ch);
  }
  public boolean print(int n)
  {
    //Check if n is a perfect cube
    int cubeRoot =
    (int)Math.round(Math.cbrt(n));
    if (cubeRoot * cubeRoot * cubeRoot
    == n) {
    int s = 0;
    int t = n;
    while (t != 0) {
      int d = t % 10;
      s += d;
      t /= 10;
    }
    if (s == cubeRoot) {
      return true;
    }
    else
      return false;
  }
  public void print()
  {
    int i,j,k=1;
    for(i=1;i<=4;i++)
    for(j=1;j<=i;j++)
    System.out.print(k++ + " ");
    System.out.println();
  }
  void print(int a,char ch)
  {
    if (ch=='s' || ch=='S')
    System.out.println(a*a);
    else if(ch=='c' || ch=='C')
    System.out.println(a*a*a);
  }
}
```

5.

```
import java.util.Scanner;
public class ProgBubbleSortDsc
{
  public static void main(String
  args[])
  { Scanner in = new
    Scanner(System.in);
    int n = 10;
    int arr[] = new int[n];
    System.out.println("Enter the
    elements of the array:");
    for (int i = 0; i < n; i++) {
      arr[i] = in.nextInt();
    }
    for (int i = 0; i < n - 1; i++) {
      for (int j = 0; j < n - i - 1;
      j++) {
        if (arr[j] < arr[j + 1]) {
          int t = arr[j];
          arr[j] = arr[j+1];
          arr[j+1] = t;
        }
      }
    }
    System.out.println("Sorted
    Array:");
    for (int i = 0; i < n; i++) {
      System.out.print(arr[i] + " ");
    }
  }
}
```

6.

```
import java.util.Scanner;
class Range{
public static void main (String
args[]){
  double min,max;
  Scanner scan=new Scanner(System.in);
  double arr[]=new double[20];
  for(int i=0; i<20; i++){
    System.out.print("Enter the
    element "+(i+1)+": ");
    arr[i]=scan.nextDouble();

    min=arr[0];
    max=arr[0];
    for(int i=0; i<20; i++){
      if(min>arr[i]){
        min=arr[i];
      } if(max<arr[i]){ max=arr[i];
      }
    }
    System.out.print("Range of the array
    is:"+ (max-min));
}
```

7.

```
import java.util.Scanner;
class ProgReverse {
  public static void main (String[]
  args)
  { Scanner sc=new Scanner(System.in);
    String str="", nstr="";
    char ch;
    int vc=0;
    System.out.println("Enter a
    string:");
    str=sc.nextLine();
    for (int i=0; i<str.length(); i++)
    {
      ch= str.charAt(i);
      nstr= ch+nstr;
      ch=Character.toUpperCase(ch);
      if (ch=='A' || ch=='E' ||
      ch=='I' || ch=='O' || ch=='U')
      vc++;
    }
    System.out.println("Reversed word:
    "+ nstr);
```

```
      System.out.println("No. of
      vowels:" + vc);
    }
  }
```

8.

```
import java.util.*;
public class linstring
{
  public void linsearch(String
  string[], String search
  {
    int i;
    int flag = 0,pos=0;
    for(i = 0; i<10; i++)
    {
      if (string[i].startsWith("SRI"))
      System.out.println(string[i]);
      if (search.equals(string[i]))
      {
        flag = 1;
        pos=i;
      }
    }
    if (flag ==1)
    {
      System.out.println("Word found
      at position " +(pos+1));
    }
    else
    {
      System.out.println("Word not
      found.");
    }
  }
  public static void main(String
  args[])
  {
    Scanner sc = new
    Scanner(System.in);
    String names[] = new String[10];
    linstring obj=new linstring();
    System.out.println("Enter any 10
    names.");
    int i;
    for (i = 0; i<10; i++)
    {
      names[i] = sc.nextLine();
    }
    System.out.println("Enter name to
    be searched.");
    String search1 = sc.nextLine();
    obj.linsearch(names, search1);
  }
}
```

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