2018

COMPUTER APPLICATIONS

(THEORY)

(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.*

Question 1.

(a) *Define abstraction.* **[2]**

(b) *Differentiate between searching and sorting.* **[2]**

(c) *Write a difference between the functions isUpperCase( ) and toUpperCase( ).* **[2]**

(d) *How are private members of a class different from public members ?* **[2]**

(e) *Classify the following as primitive or non-primitive datatypes :* **[2]**

(i) char
(ii) arrays
(iii) int
(iv) classes

Answer 1.

(a) It is the act of representing essential features without including the background details.

(b)

Searching	Sorting
It is the process of checking whether the element is present in the array or not.	It is the process of arranging the data in the array.
Types of searching techniques are linear and binary search.	Types of sorting techniques are exchange selection and bubble sort.

(c)

isUpperCase()	toUpperCase()
This function is used to check whether a character is in upper case or not.	This function is used to convert a character in upper case.
Return type is boolean.	Return type is char.

(d)

Private Members	Public Members
It is the most restricted access specifier.	It is the least restricted access specifier.
Members declared under this section are only accessible in their own class.	Members declared under this section are accessible in all parts of a java program.

(e) primitive : (i) char, (iii) int
non-primitive : (ii) arrays, (iv) classes

Question 2.

(a) *(i) int res = 'A';*
*What is the value of **res** ?*
(ii) Name the package that contains wrapper classes. **[2]**

(b) *State the difference between **while** and **do while** loop.* **[2]**

(c) *System.out.print("BEST");*
System.out.println ("OF LUCK");
Choose the correct option for the output of the above statements **[2]**

(i) BEST OF LUCK
(ii) BEST
OF LUCK

(d) *Write the prototype of a function* ***check*** *which takes an integer as an argument and returns a character.* **[2]**

(e) *Write the return data type of the following function.* **[2]**

(i) endsWith( )

(ii) log( )

Answer 2.

(a) (i) res=65 (ii) java.lang

(b)

while	do while
It is not guaranteed that how many times loop body will get executed.	It is guaranteed that loop body will get executed atleast once.
It is a pre-tested loop.	It is a post tested loop.

(c) (i) BEST OF LUCK is the correct option.

(d) char check(int n)

(e) (i) boolean (ii) double

Question 3.

(a) *Write a Java expression for the following :* $\frac{\sqrt{3x + x^2}}{a + b}$ **[2]**

(b) *What is the value of y after evaluating the expression given below ?* **[2]**

y+= ++y + y-- + --y; when int y=8

(c) *Give the output of the following :* **[2]**

(i) Math.floor (–4.7)

(ii) Math.ceil(3.4) + Math.pow(2,3)

(d) *Write two characteristics of a constructor.* **[2]**

(e) *Write the output for the following :* **[2]**

```
System.out.println("Incredible"+
"\n"+"world");
```

(f) *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");
elseif(var==3)
    System.out.println("best");
else
    System.out.println("invalid");
```

(g) *Give the output of the following string functions :* **[2]**

(i) *"ACHIEVEMENT".replace ('E','A')*

(ii) *"DEDICATE".compareTo ("DEVOTE")*

(h) *Consider the following String array and give the output* **[2]**

```
String arr[]= {"DELHI",
"CHENNAI", "MUMBAI",
"LUCKNOW", "JAIPUR"};
System.out.println(arr[0].length()
                    >arr[3].length());
System.out.print(arr[4].substring
                    (0, 3));
```

(i) *Rewrite the following using ternary operator :* **[2]**

```
if(bill > 1000)
discount = bill * 10.0/100;
else
discount=bill * 5.0/100;
```

(j) *Give the output of the following program segment and also mention how many times the loop is executed :* **[2]**

```
int i;
for (i = 5; i > 10; i ++)
System.out.println(i);
System.out.println ( i * 4 );
```

Answer 3.

(a) Math.sqrt((3 * x) + (x * x))/(a + b);

(b) 33

(c) (i) – 5.0 (ii) 12.0

(d) (i) Constructors have the same name as that of the class.

(ii) They do not have any return type not even void.

(e)
```
Incredible
world
```

(f)
```
switch(var)
{
  case 1: System.out.println("good");
          break;
  case 2 : System.out.println
                    ("better");
          break;
  case 3 : System.out.println
                    ("best");
          break;
  default : System.out.println
                    ("invalid");
}
```

(g) (i) ACHIAVAMANT
(ii) – 18

(h) false
JAI

(i) discount = bill > 10000 ? (bill * 10.0 / 100) : (bill * 5.0 / 100) ;

(j) Loop will be executed 0 times since the test condition is initially false.
Output will be : 20.

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.***

Question 4.

*Design a class **RailwayTicket** with following description :* **[15]**

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 :

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*
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 moible number.

Write a main method to create an object of the class and call the above member methods.

Answer 4.

```
import java.util.*;//importing package
class RailwayTicket
{
  String name, coach;
   long mobno;
   int amt, totalamt;
   void accept()
   {
      Scanner sc=new
              Scanner(System.in);
      System.out.println("Enter
                          Details");
      name=sc.nextLine();
      coach=sc.nextLine();
      mobno=sc.nextLong();
      amt=sc.nextInt();
   }
   void update()
   {
      if(coach.equalsIgnoreCase
                          ("First_AC"))
```

```
    {
     totalamt=amt + 700;
    }
     else if(coach.equalsIgnoreCase
                        ("Second_AC"))
    {
     totalamt=amt + 500;
    }
    else  if(coach.equalsIgnoreCase
                        ("Third_AC"))
    {
     totalamt=amt + 250;
    }
    else if(coach.equalsIgnoreCase
                        ("sleeper"))
    {
     totalamt=amt;
    }
  }
  void  display()
  {
     System.out.println("Name : " +
                                name);
     System.out.println("Coach : " +
                                coach);
     System.out.println("Mobile
                        no. : " + mobno);
     System.out.println("Amt : " +
                                amt);
    System.out.println("Total Amt :
                        " + totalamt);
  }
  public static void main
                        (String args[])
  {
    RailwayTicket ob =new
                        RailwayTicket();
    ob.accept();//function call
    ob.update();
    ob.display();
  }
}
```

Question 5.

Write a program to input a number and check and print whether it is a ***Pronic*** *number or not. (Pronic number is the number which is the product of two consecutive integers)* **[15]**

Example : $12 = 3 \times 4$
$20 = 4 \times 5$
$42 = 6 \times 7$

Answer 5.

```
import java.util.*;//importing package
class Pronic
{
  int n, i = 1 , p = 0;
  void display()
  {
    Scanner sc=new
                Scanner(System.in);
    System.out.println("Enter a
                        number");
    n=sc.nextInt();
    while(p<=n)
    {
      p=i*(i+1);
      if(p==n)
      {
        System.out.println
                ("Pronic Number");
        break;
      }//while loop ending
      else if(p>n)
      {
        System.out.println
          ("Not a Pronic Number");
        break;
      }
      else
      {
        i++;
      }
    }
  }
}
```

Question 6.

Write a program in Java to accept a string in lower case and change the first letter of every word to upper case. Display the new string.

Sample input : we are in cyber world.
Sample output : We Are In Cyber World. **[15]**

Answer 6.

```
import java.util.*;//importing package
class Demo
{
  String s,w;
  char ch;
  int i, l;
  void display()
  {
    Scanner sc=new
                  Scanner(System.in);
    System.out.println("Enter a
                              Sentence");
    s=sc.nextLine();
    s= s + " ";
    l=s.length();
    for(i=0; i< l; i++)
    {
      w="";
      while(s.charAt(i)!=' ')
      {
        w=w+s.charAt(i);
        i++;
      }//while loop ending
      ch=w.charAt(0);
      ch-=32;
      w=ch + w.substring(1);
      System.out.print(w + " " );
    }
  }
}
```

Question 7.

Design a class to overload a function volume () as follows : **[15]**

(i) double volume (double R) –with radius (R) as an argument, returns the volume of sphere using the formula.
$V = 4/3 \times 22/7 \times R^3$.

(ii) double volume (double H, double R)–with height(H) and radius(R) as the arguments, returns the volume of a cylinder using the formula.
$V = 22/7 \times R^2 \times H$

(iii) double volume (double L, double B, double H)–with length(L), breadth(B) and Height(H) as the arguments, returns the volume of a cuboid using the formula.
$V = L \times B \times H$

Answer 7.

```
class Overload
{// class beginning
  double V;
  double volume(double R)
  {
    V=(4.0/3)*(22/7)*R*R*R);
    return (V);
  }
  double volume(double H, double R)
  {
    V=(22/7)*(R*R)*H;
    return (V);
  }
  double volume
       (double L, double B, double H)
  {
    V=L*B*H;
    return (V);//returning the value of
     V
  }
}
```

Question 8.

Write a menu driven program to display the pattern as per user's choice. **[15]**

Pattern 1	***Pattern 2***
ABCDE	*B*
ABCD	*LL*
ABC	*UUU*
AB	*EEEE*
A	

For an incorrect option, an appropriate error message should be displayed.

Answer 8.

```
import java.util.*;//importing package
class Menu
```

```
{
  int ch, l, i, j;
  String s;
  public Menu()// constructor
  {
      s= "";
  }
  void display()
  {
     Scanner sc=new
                    Scanner(System.in);
     System.out.println("Enter 1 for
                                Pattern1");
     System.out.println("Enter 2 for
                                Pattern2");
     ch=sc.nextInt();
     if(ch==1)
     {
       s="ABCDE";
       l=s.length();
       for(i=l-1; i>=0; i--)
       {
         for(j=0; j<=i; j++)
         {
         System.out.print(s.charAt(j));
         }
         System.out.println();
       }
     }
     else if(ch==2)
     {
       s="BLUE";
       l=s.length();
       for(i=0; i<l; i++)
       {
         for(j=0; j<=i; j++)
         {
         System.out.print(s.charAt(i));
         }
         System.out.println();
       }
     }
     else
     {
      System.out.println("Invalid
                                Choice");
     }
   }
}
```

Question 9.

Write a program to accept name and total marks of N number of students in two single subscript array ***name[ ]*** *and* ***totalmarks[ ].*** **[15]**

Calculate and print :

(i) The average of the total marks obtained by N number of students.
[average = (sum of total marks of all the students)/N]

(ii) *Deviation of each student's total marks with the average.*
[deviation = total marks of a student – average]

Answer 9.

```
import java.util.*;//importing package
class Student
{
   int n, i, s=0;
   double avg, d;
    void display()
    {
      Scanner sc=new
                    Scanner(System.in);
      System.out.println("Enter number
                                of students");
      n=sc.nextInt();
      String name[]=new String[n];
      int totalmarks[]=new int[n];
      for(i=0; i<n; i++)
      {
          System.out.println("Enter
                name and total marks");
          name[i]=sc.nextLine();
          totalmarks[i]=sc.nextInt();
          s=s+totalmarks[i];
      }
      avg=(double)s/n;
      System.out.println("Average = "
                                + avg);
      for(i=0; i<n; i++)
      {
          d=totalmarks[i]-avg;
          System.out.println(name[i]
                + " Deviation is " + d);
      }
    }
} // class end
```