

EXPERIMENT → 1

Aim: To construct the PV table for comparing the PV isotherm of an ideal gas at different temperature.

Theory:

Microsoft Excel is a powerful tool. It is used for exploring various calculations and plotting graphical relationships.

Ideal gas is a theoretical gas whose molecules occupy negligible space and have no interaction and also follows all gas laws at all pressure & temperature.

Ideal gas Equation is a equation defining the states of the hypothetical gases expressed mathematically - the combinations of empirical & physical constants.

$$PV = nRT$$

Where, P → Pressure of ideal gas

V → Volume of ideal gas

n → amount of ideal gas in moles

R → Gas Constant

T → Temperature (K)

Different values of Gas Constant 'R': (i) 8.314 J/mol K

(ii) $0.0821 \text{ Latm/mol K}$

(iii) 1.987 Cal/mol K

(iv) $8.314 \text{ m}^3 \text{ Pa/mol K}$

Teacher's Signature :

In excel sheet, we are putting these values:

$$\text{Temperature} - T_1 = 100 \text{ K}$$

$$T_2 = 1000 \text{ K}$$

$$T_3 = 3000 \text{ K}$$

Pressure - atm

$$n = 1 \text{ mol}$$

$$\text{Volume} = 5, 10, 15 \dots \text{L}$$

So, we will take $R = 0.0821 \text{ Latm/molK}$

Programme

Version \Rightarrow Excel 2019

Characters

'=' \Rightarrow put before writing formula

'+' \Rightarrow used for addition

'-' \Rightarrow used for subtraction

'*' \Rightarrow used for multiplication

'/' \Rightarrow used for division

'\$' \Rightarrow placed before column or row to keep that column or row constant.

Formula Used \Rightarrow

$$P = (n * R * T) / V$$

Procedure

MS Excel was opened

The value of n , R was written in each cell.

Different values of temperature (T_1, T_2, T_3) and volumes was written in each cell horizontally & vertically respectively by using formula.

The values of pressure was calculated by using formula.

PV isotherm table was formed.

The table was selected & scatter graph was plotted

The title of graph, X-Axis & Y-Axis was edited according to your choice.

Result

PV isotherm of ideal gas at different temperatures was constructed.

As the volume of gas increases, the pressure of gas falls continuously at constant temperature.

~~Prachi
21/2/24~~

EXPERIMENT 2

Aim: Given the value of a & b for various real gases. Make a PV table for :

- Comparing the P-V graph of the given real gases at 300 K.
- P-V isotherm of any 1 gas at least 5 temperatures.
 $n=1$.

Gases	Ar	CO ₂	He	Xe
a	1.33	3.61	0.0341	4.137
b	3.2	4.29	2.38	5.16

$\text{atm dm}^6 \text{ mol}^{-2}$
 $(\times 10^{-2}) \text{ dm}^3 \text{ mol}^{-1}$

Theory:

Vander waals equation is the modified version of the ideal gas equation, which is for real gas.

$$\left(P + \frac{an^2}{V^2} \right) (V - nb) = nRT$$

Where, $P \rightarrow$ Pressure of gas

$V \rightarrow$ Volume of gas

$T \rightarrow$ temperature of gas

$n \rightarrow$ amount of gas in moles

a & $b \rightarrow$ Real constant (Vander waals constant)

$R \rightarrow$ Gas constant

Formula Used $\Rightarrow P = \left(\frac{(n * R * T)}{(V - (n * b))} \right) - \left(\frac{(a * n * n)}{(V * V)} \right)$

Procedure

MS Excel was opened.

The value of n , R , T was inserted in each cell.

The value of real constant (a & b) for Ar, CO, He & Xe was also inserted in respective cells.

Table 1 (PV isotherm of given real gases at 300k) was constructed as name of gases & volume (L) was written in each cell horizontally & vertically respectively.

The corresponding values of pressure (atm) was calculated for given real gases at 300k by using formula.

The data was selected & PV isotherm graph was plotted. The title of graph and other minor details was added laterly.

Table 2 (PV isotherm of Ar gas at different temperature) was constructed as different values of temperature (100k, 500k, 1000k, 2000k, 3000k) and volume (L) was written in each cell horizontally & vertically respectively.

The corresponding values of pressure (atm.) was calculated for Ar gas at diff. Temperature by using formula.

The graph was plotted and minor details were added afterwards.

~~Result:~~ PV isotherm of given real gases at 300k was constructed

PV isotherm of Ar at different temperatures was constructed.

As the vol. (L) increases the pressure of all given gases fall continuously at constant temp. (300k).

As the vol. of gas increases, the pressure of real gas falls continuously at different temperature.

As the temp. rises, the pressure also increased.

EXPERIMENT 3

Aim: Plot $\frac{1}{N} \frac{dN_V}{dV}$ vs V at different temperature for ${}^4\text{He}$ gas.
 $T = 298\text{ K}, 500\text{ K}, 1000\text{ K}$.

Make the following columns in the excel with $dV = 100\text{ m/s}$. Calculate coefficient at all the temperature before filling the table.

Theory:

The Maxwell-Boltzmann distribution equation,

$$\frac{1}{N} \frac{dN_V}{dV} = 4\pi \left(\frac{M}{2\pi RT} \right)^{3/2} V^2 e^{-\frac{MV^2}{2RT}}$$

$$\boxed{\frac{1}{N} \frac{dN_V}{dV} = (\text{coeff } v) V^2 e^{-\frac{MV^2}{2RT}}}$$

Where, M = molecular weight in kg/mol

R = Gas Constant J/(Kmol)

T = Temperature (K)

v = Velocity (m/s)

N_V = No. of molecules having velocity v .

In excel sheet, we put the following values :

Molecular weight, $M = 4.00 \times 10^{-3} \text{ kg/mol}$

Velocity $v - \text{m/s}$

$R = 8.314 \text{ J/molK}$

Temperature $\rightarrow 298\text{ K}, 500\text{ K}, 1000\text{ K}$.

Characters used: (=) Put before writing formula (*) used for multiplication
 (+) used for addition (/) used for division
 (-) used for subtraction (EXP()) exponential function

(PI()) 3.14

(\$) Placed before column or row to keep that constant

$$\text{Formula : } \Rightarrow \frac{1}{N} \left(\frac{dN_v}{dv} \right) = 4 * \text{PI}() * \left((\$D\$3 / (2 * \text{PI}() * \$D\$2 * D\$5)) \right)^{(3/2)} * (\$C7^2) * \left(\text{EXP}((- \$D\$3 * \$C7 * \$C7) / (2 * \$D\$2 * D\$5)) \right)$$

Procedure :

MS Excel was opened.

The value of π , M, R and temperatures (298K, 500K, 1000K) was written in each cell.

Table was constructed as temperature and velocity were written in different cells horizontally & vertically.

The corresponding values of $\frac{1}{N} \frac{dN_v}{dv}$ was calculated by using formula
of dragging

The data was selected & the graph was plotted.

Lastly the minor details were added to finish.

Result : Maxwell-Boltzmann velocity distribution graph was plotted at different temperatures for ${}^4\text{He}$ (Helium) gas.

Maxwell
 Boltzmann
 gas
 298K

EXPERIMENT 4

Aim: Plot $\frac{1}{N} \frac{dN_v}{dv}$ vs v at 298.15 K for Helium (${}^4\text{He}$), Neon (${}^{20}\text{Ne}$)
Argon (${}^{40}\text{Ar}$) and Xenon (${}^{132}\text{Xe}$)

TheoryProgram

Excel version 2019.

$$\frac{1}{N} \left(\frac{dN_v}{dv} \right) = 4\pi \left(\frac{M}{2\pi RT} \right)^{3/2} v^2 e^{\left(-\frac{mv^2}{2RT} \right)}$$

Formula used:

$$\frac{1}{N} \left(\frac{dN_v}{dv} \right) = 4 * \text{PI}() * (((C\$6)/(2 * \text{PI}()) * \$C\$4 * \$C\$5))^{(3/2)} * \\ (\$B\$1^2) * (\text{EXP}(-C\$6 + \$B\$1 * \$B\$1)/(2 * \$C\$4 * \$C\$5)))$$

Procedure

MS Excel was opened.

The value of R, π , T & mass of different gases were input in the respective cells.

The table was constructed as name of gases & velocity was written in each cells horizontally & vertically respectively.

Teacher's Signature : _____

The corresponding values of $\frac{1}{N} \left(\frac{dN_v}{dv} \right)$ was calculated for different gases at 298.14 K by formula.

The data was selected and the graph was plotted.

The minor details were added to the graph to finish it.

Result: Maxwell - Boltzmann velocity distribution graph was plotted for different gases at 298.14 K temperature.

Ruchi
28/9/2024

EXPERIMENT → 5

Aim : Plot $\frac{1}{N} \frac{dN_E}{dE}$ vs E at different temperatures for

Helium (${}^4\text{He}$) gas $T = 298\text{ K}, 500\text{ K}, 1000\text{ K}$.

Make the following columns in the excel with $dE = 1000\text{ J}$.

Theory :

Maxwell - Boltzmann Distribution equation for energy ;

$$\frac{1}{N} \frac{dN_E}{E} = 2\pi \left(\frac{1}{\pi RT} \right)^{3/2} \sqrt{E} e^{-E/RT}$$

$$\frac{1}{N} \frac{dN_E}{E} = (\text{coeff 2}) \sqrt{E} e^{-E/RT}$$

Where , E = Energy (J)

N_E = No. of molecules having energy E

T = Temperature (K)

R = Gas constant J/(kmol)

The values used for the program .

Temperature $\rightarrow 298\text{ K}, 500\text{ K}, 1000\text{ K}$.

Energy - J

$R \rightarrow 8.314\text{ J/mol K}$

Program : Excel version 2019

Formula Used :

$$\frac{1}{N} \left(\frac{dN_E}{dE} \right) = 2 * \pi(1)^* \left(1 / (\pi(1)^* D\$2*D\$4) \right)^{(3/2)*} \\ (\$c5^{(1/2)})^* \left(\exp((- \$c5) / (\$D\$2*D\$4)) \right)$$

Procedure

MS Excel was opened

The values of π , R, T were inserted in each their respective cells.

A table was constructed as temperature and Energy was taken in each cell horizontally & vertically respectively.

The corresponding values of $\frac{1}{N} \frac{dN_E}{dE}$ were calculated for given

Helium gas at different temperature by using formula

The data was selected and graph was plotted.

Lastly well labelled the graph accordingly.

Result : Maxwell-Boltzmann Energy distribution graph were obtained at different temperatures for Helium gas

Ruchi
20/2/24

EXPERIMENT 6

Aim: Plot of Concentration Vs Absorbance graph and also calculate the molar absorptivity coefficient.

Theory:

Lambert Beer's Law states that, "When a beam of monochromatic light is passed through a solution of an absorbing substance, then the rate of decrease in intensity of radiation with the thickness of absorbing solution is directly proportional to the intensity as well as to the concentration of the solution."

$$[A = \epsilon Cl]$$

Where, $A \rightarrow$ Absorbance

$\epsilon \rightarrow$ Molar absorption Coefficient ($M^{-1}cm^{-1}$)

$C \rightarrow$ Molar Concentration (M)

$l \rightarrow$ Optical path length (cm)

Program: Excel version 2019.

Curve fitting

* Create data

* Create empty scatterplot and add series

* Add trendline

* Then display equation on chart and R^2 value on chart & set intercept zero.

Procedure

MS Excel was opened

The value of path length was inserted in different cell.
Table was formulated as concentration & absorbance were written
and data of absorbance at different concentration were
written below.

Then empty scatter plot was created then X-series and
Y-series were added.

The straight / linear trendline was added then display equation
& R² value on chart and intercept 0 was set.

The title of graph and X, Y axis were edited accordingly.

Result:

Molar absorption coefficient; $\epsilon = 397.02 \text{ M}^{-1} \text{ cm}^{-1}$ (from graph)

$\epsilon = 356.46 \text{ M}^{-1} \text{ cm}^{-1}$ (calculation)

The concentration vs absorbance graph was plotted
Straight line formed.

As the concentration increases, the absorbance also increases

A \propto C
Proportionality

EXPERIMENT 7

Aim: Plot the conductometric titration curve from the given data and find the equivalence point graphically.

Theory:

Conductometric titration is a type of titration in which the electrolytic conductivity of the reaction mixture is continuously monitored as one of the reactants were added.

Program

Version Excel 2019

Curve fitting

- * Create data
- * Create empty scatter plot
- * Add series
- * Add trendline
- * Then display equation and R^2 value on chart
- * Set intercept zero.

Procedure:

MS Excel was opened

A table was constructed as no. of drops of base and conductance were written & given data was inserted below them.

The empty scatter plot was created, then X & Y - series were added.

Then straight trendline were added and displayed equation & R^2 on chart.

The trendlines was extended by putting values on both equations.

Another line was drawn at the intersection point (also known as equivalence point).

The title of graph, X-axis and Y-axis was edited accordingly.

Result: Equivalence Point, $V_{eq} = 65$ drops of base.

~~Panchal
On 25/10/2014~~

PROGRAM #1

To Calculate the pressure of an ideal gas

CLS

REM To Calculate the pressure of an ideal gas

PRINT "Program No. 1 : To Calculate pressure of an ideal gas"

PRINT

PRINT "***** * * * * "

PRINT Date\$; " and "; Time\$

PRINT "DEVRAJ RAWAT"

PRINT "2131231"

PRINT "***** * * * * "

PRINT

LET R = 8.314

INPUT "Enter the no. of moles of the gas "; n

INPUT "Enter the volume of the gas in L "; V

INPUT "Enter the temperature of the gas in K "; T

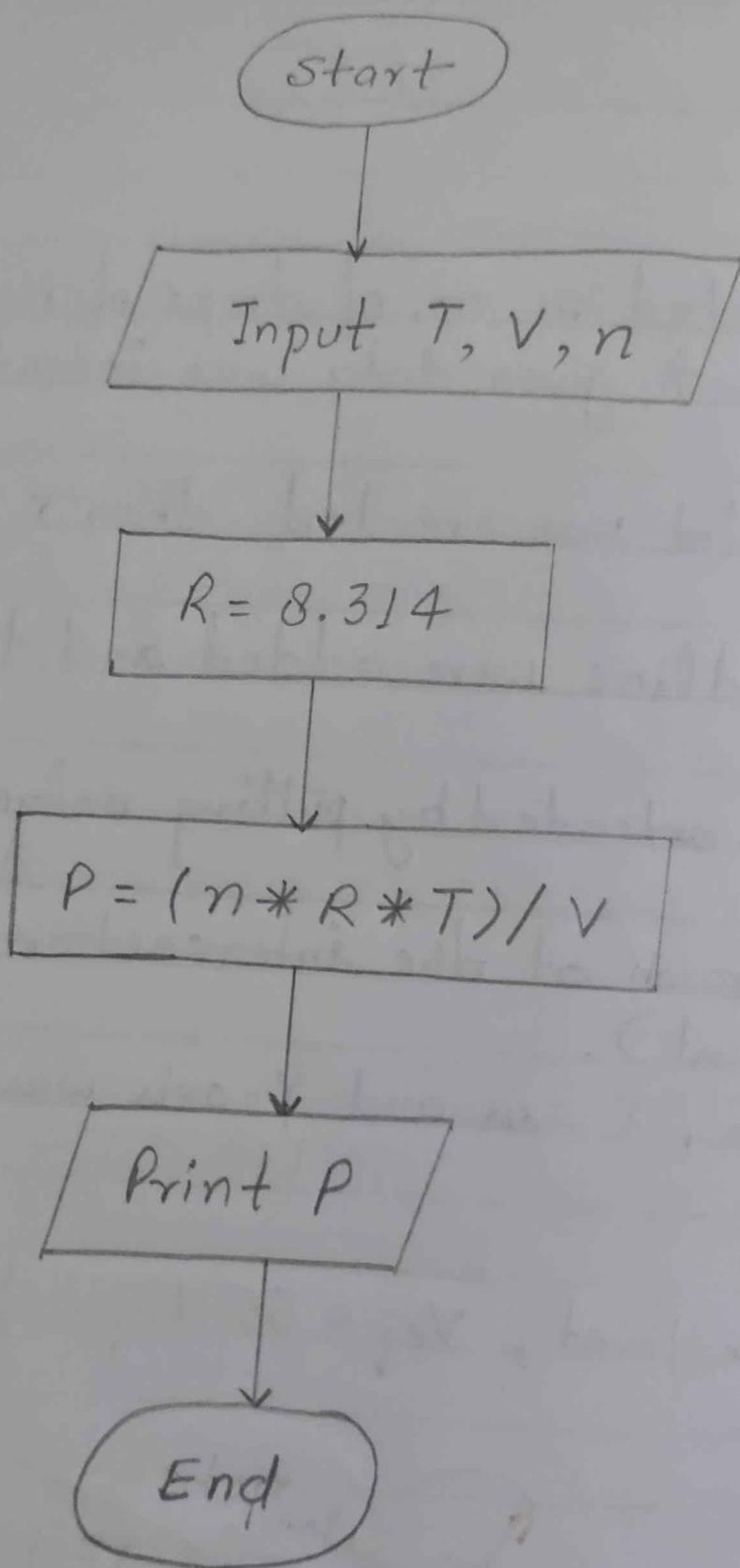
$$P = (n * R * T) / V$$

PRINT "The pressure of "; n; "moles of an ideal gas confined to a container of capacity "; V; "L at "; T; "K is "; P; "atm."

PRINT

END.

*Kalpana
20/3/2024*



Cls

Rem To calculate the pressure for an ideal gas

Print "Program No. 1: To calculate pressure of an ideal gas"

Print

Print "*****"

Print Date\$; " and "; Time\$

Print "DEVRAJ RAWAT"

Print "2131231"

Print "*****"

Print

Let R = 8.314

Input "Enter the no. of moles of the gas "; n

Input "Enter the volume of the gas in L "; V

Input "Enter the temperature of the gas in K "; T

$$P = (n * R * T) / V$$

Print "The pressure of "; n; " moles of an ideal gas confined to a container of capacity "; V; " L at "; T; " K is "; P; " atm"

Print

End

02/28/2024
10:58:02

```
Untitled
Program No. 1: To calculate pressure of an ideal gas
*****
02-28-2024 and 10:58:02
DEURAJ RAWAT
2131231
*****
Enter the no. of moles of the gas ? 5
Enter the volume of the gas in L ? 5
Enter the temperature of the gas in K ? 100
The pressure of 5 moles of an ideal gas confined to a container of capacity
5 L at 100 K is 831.4 atm.
```

Press any key to continue

PROGRAM # 2

Program to calculate the pressure for a real gas.

CLS

REM To calculate the pressure for real gas

PRINT "Programme No. 2 : To Calculate pressure of a real gas "

PRINT "*****"

PRINT Date \$; " and "; Time \$

PRINT "DEVRAJ RAWAT"

PRINT "2131231"

PRINT "*****"

LET R = 0.0821

INPUT "Enter the no. of moles of the gas "; n

INPUT "Enter the volume of the gas in L "; V

INPUT "Enter the temperature of the gas in K "; T

INPUT "Enter the value of a for the gas in atm L¹²/mol¹² "; a

INPUT "Enter the value of b for the gas in L/mol "; b

P = ((n*R*T)/(V - n*b)) - ((a*n*n)/V*V))

PRINT "The pressure of "; n; "moles of a real gas confined to a container of capacity "; V; "L having real gas constant "; a; "atm L¹²/mol¹² and "; b; "L/mol is "; P; "atm."

END.

Kalpana
20/3/2024

cls

Rem To calculate the pressure for real gas

Print "Program No. 2: To calculate pressure of a real gas"

Print "*****"

Print Date\$; " and "; Time\$

Print "DEVRAJ RAWAT"

Print "2131231"

Print "*****"

Let R = 0.0821

Input "Enter the no. of moles of the gas "; n

Input "Enter the volume of the gas in L "; V

Input "Enter the temperature of the gas in K "; T

Input "Enter the value of a for the gas in atmL^2/mol^2 "; a

Input "Enter the value os b for the gas in L/mol "; b

$$P = ((n * R * T) / (V - n * b)) - ((a * n * n) / (V * V))$$

Print "The pressure of "; n; " moles of a real gas confined to a container of capacity "; V; " L at "; T; " K having real gas constant "; a; "atmL^2/mol^2 and "; b; "L/mol is "; P; "atm."

End

Untitled

Program No. 2: To calculate pressure of a real gas

02-28-2024 and 11:44:45

DEVRAYA
2131231

Dev Ray
2131231

Enter the no. of moles of the gas ? 1

Enter the volume of the gas in L ? 5

Enter the temperature of the gas in K ? 300

Enter the value of a for the gas in atmL^2/mol^2 ? 1.337

Enter the value os b for the gas in L/mol ? 0.032

The pressure of 1 moles of a real gas confined to a container of capacity 5 L at 300 K having real gas constant 1.337 atmL^2/mol^2 and .032 L/mol is 4.904249 atm.

Press any key to continue

Start

Input T, V, n, a, b

$R = 0.0821$

$$P = ((n * R * T) / (V - n * b)) - ((a * n * n) / (V * V))$$

Print P

End

PROGRAM #3

Program to calculate the most probable, average and root mean square velocities of a gas.

CLS

REM To calculate the most probable, average and root mean square velocities of a gas

PRINT "Program No. 3 : To calculate the most probable, average and root mean square velocities of a gas"

PRINT "***** * * *"

PRINT Date \$; "and"; Time \$

PRINT "DEVRAJ RAWAT"

PRINT "2131231"

PRINT "***** * * * *"

LET R = 8.314

LET T = 300

REM T in K

LET PI = 3.14

INPUT "Enter the molar mass of the gas in kg/mol"; M

Crms = $SQR((3 * R * T) / M)$

Cmp = $SQR((2 * R * T) / M)$

Cavg = $SQR((8 * R * T) / (PI * M))$

PRINT "The Root Mean Square velocity is "; Crms; "m/s"

PRINT "The Most Probable velocity of the gas is "; Cmp; "m/s"

PRINT "The average velocity of the gas is "; Cavg; "m/s"

END.

*Kalpana
20/3/2024*

cls

Rem To calculate the most probable, average and root mean square velocities of a gas

Print "Program No. 3: To the most probable, average and root mean square velocities of a gas"

Print "*****"

Print Date\$; " and "; Time\$

Print "DEVRAJ RAWAT"

Print "2131231"

Print "*****"

Let R = 8.314

Let T = 300

Rem T in K

Let Pi = 3.14

Input "Enter the molar mass of the gas in kg/mol "; M

Crms = Sqr((3 * R * T) / M)

Cmp = Sqr((2 * R * T) / M)

Cavg = Sqr((8 * R * T) / (Pi * M))

Print "The Root Mean Square velocity is "; Crms; "m/s"

Print "The Most Probable velocity of the gas is "; Cmp; "m/s"

Print "The average velocity of the gas is "; Cavg; "m/s"

End

Red
28/07/24

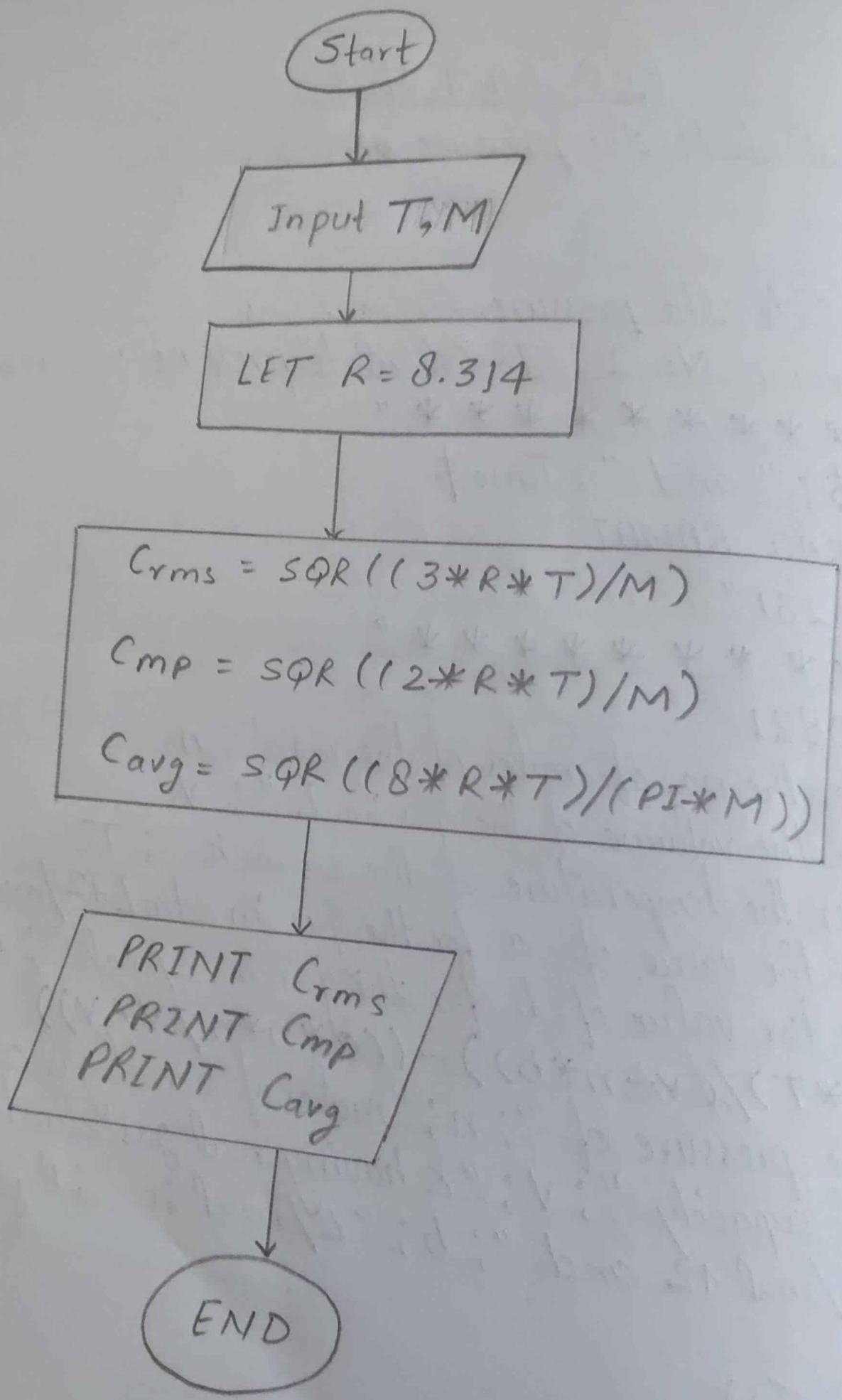
Untitled

Program No. 3: To the most probable, average and root mean square velocities of a gas

02-28-2024 and 12:30:22
DEVRAYA RAWAT
2131231

Enter the molar mass of the gas in kg/mol ? 44
The Root Mean Square velocity is 13.04067 m/s
The Most Probable velocity of the gas is 10.64766 m/s
The average velocity of the gas is 12.01765 m/s

Press any key to continue...



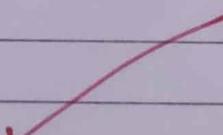
PROGRAM #4

Program to find out the sum & product of first 'n' natural numbers using If.... Then...Else statement.

```

10 CLS
20 REM To find out the sum & product of first n natural numbers
30 PRINT "Program No. 4 : To find out the sum & product of first n natural no."
40 PRINT "***** * * * *"
50 PRINT Date $; " and "; Time $
60 PRINT "DEVRAJ RAWAT"
70 PRINT "2131231"
80 PRINT "***** * * * *"
90 INPUT "Enter the value of N "; N
100 LET S = 0
110 LET P = 1
120 LET I = 1
130 S = S + I
140 P = P * I
150 I = I + 1
160 If I > N Then 170 Else GOTO 130
170 PRINT "The Sum and product of first "; N ; " natural no. is "; S;
      "and "; P; " respectively."
180 END

```

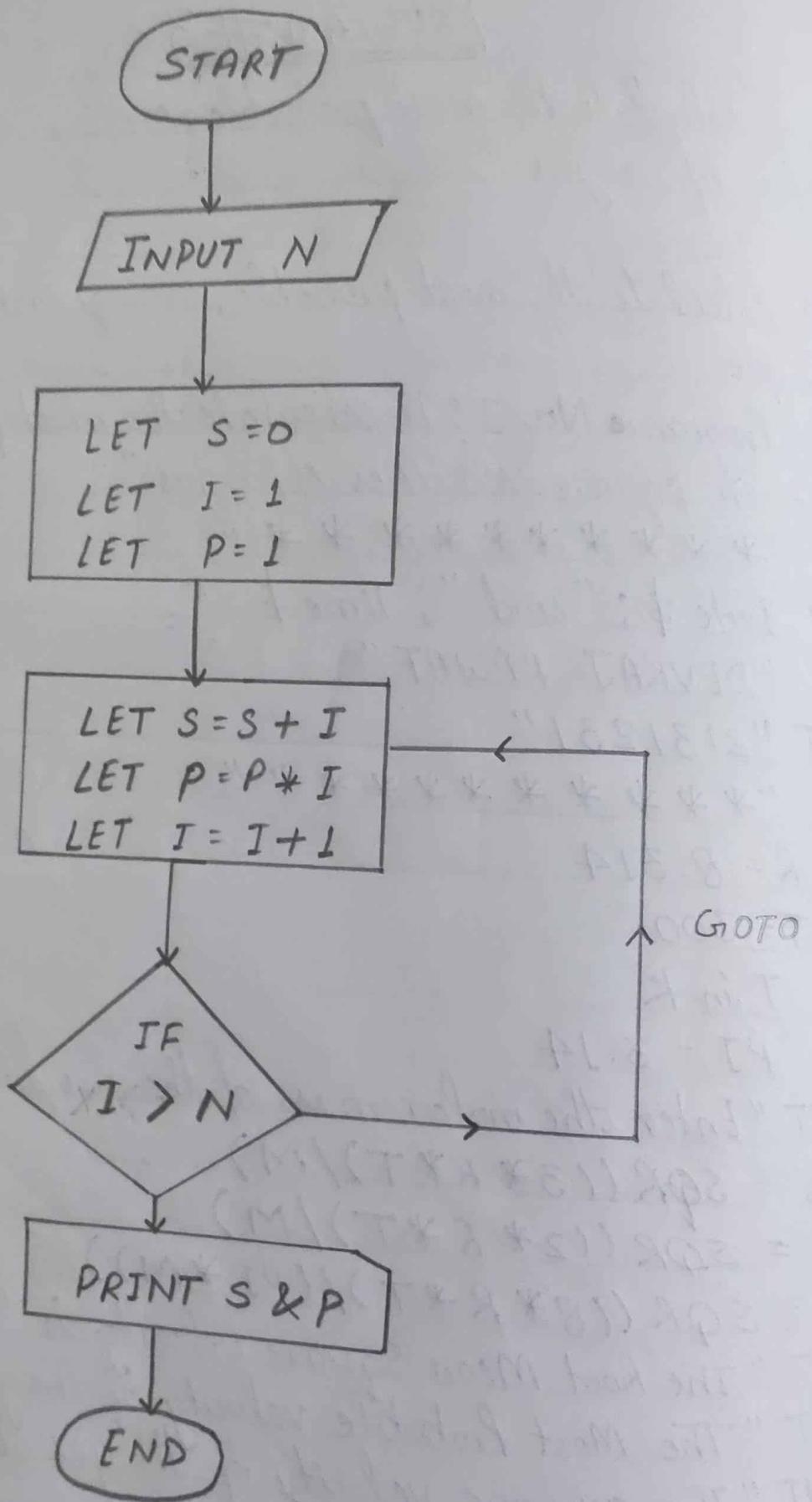


10 Cls
20 Rem To find the sum and product of first n natural numbers
30 Print "PROGRAMNO.4: To find thesum and product of first n natural numbers"
40 Print "*****"
60 Print Date\$; "and"; Time\$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print "*****"
100 Input "Enter the value of n "; N
110 Let S = 0
120 Let P = 1
130 Let I = 1
140 S = S + I
150 P = P * I
160 I = I + 1
170 If I > N Then 180 Else GoTo 140
180 Print "The sum and product of first "; N; "natural no. is "; S; "and"; P; "respectively"
190 End

PROGRAMNO.4: To find thesum and product of first n natural numbers

04-23-2024and21:30:47
DEURAJ RAWAT
2131231

Enter the value of n ? 10
The sum and product of first 10 natural no. is 55 and 3628800 respectively



Completo
2/2/04

PROGRAM #5

Program to find out the sum of the given series.

10 CLS

20 REM To find out the sum of the given series

30 PRINT "Program No. 5 : To find out the sum of the given series"

40 PRINT "***** * * * * * * * *"

50 PRINT Date \$; "and"; Time \$

60 PRINT "DEVRAJ RAWAT"

70 PRINT " 2131231 "

80 PRINT "***** * * * * * * * *"

90 INPUT "Enter the value of X"; X

100 INPUT "Enter the value of N"; N

110 LET S = 0

120 LET I = 0

130 S = S + (X ^ I)

140 I = I + 1

150 IF I <= N THEN 130 ELSE GOTO 160

160 PRINT "THE sum OF THE GIVEN SERIES "; S

170 END

10 Cls

20 Rem To find the sum the sum of given series $1+X+X^2+X^3+\dots+X^N$

30 Print "PROGRAMNO.5: To find the sum the sum of given series $1+X+X^2+X^3+\dots+X^N$ "

40 Print "*****"

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****"

100 Input "Enter the value of X"; X

110 Input "Enter the value of N"; N

120 Let S = 0

130 Let I = 0

140 S = S + (X ^ I) Rd ✓

150 I = I + 1

160 If I <= N Then 140 Else GoTo 170

170 Print "The sum of the series $1+X+X^2+\dots+X^N$ is"; S

180 End

PROGRAMNO.5: To find the sum the sum of given series $1+X+X^2+X^3+\dots+X^N$

04-23-2024 and 21:47:39

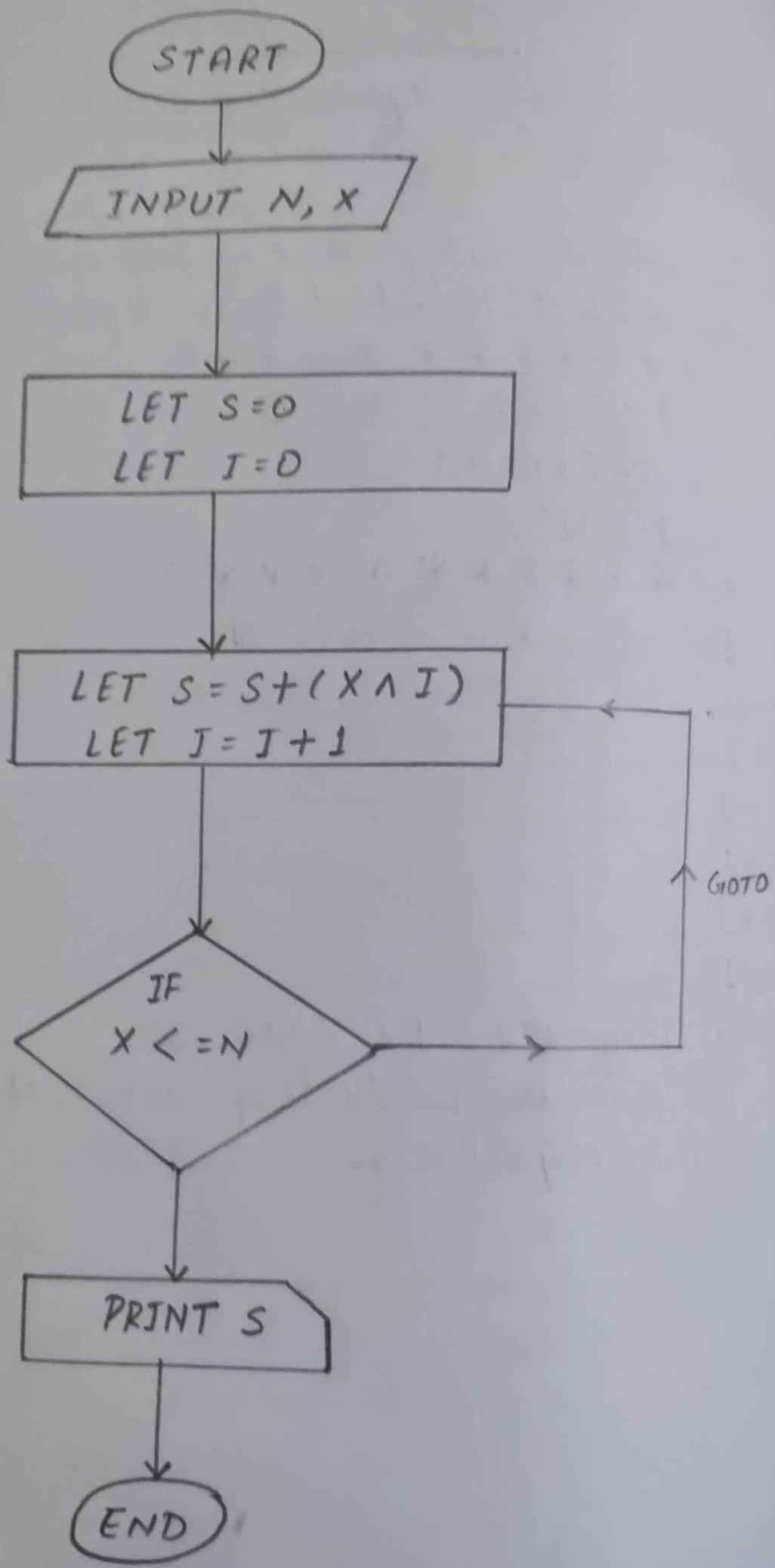
DEVRAJ RAWAT

2131231

Enter the value of X? 4

Enter the value of N? 3

The sum of the series $1+X+X^2+\dots+X^N$ is 85



PROGRAM #6

Program to find out the greater no. between the two using Read Data statement

```

10 CLS
20 REM To find out the greater no. between the two
30 PRINT "Program No. 6 : To find out the greater no. between the given two"
40 PRINT "*****"
50 PRINT Date $; " and "; Time $
60 PRINT " DEVRAJ RAWAT "
70 PRINT " 2131231 "
80 PRINT "*****"
90 READ a, b
100 DATA 865, 845
110 IF a > b THEN 120 ELSE GOTO 130
120 PRINT "The greater no. between the two is "; a : GOTO 140
130 PRINT "The greater no. between the two is "; b
140 END

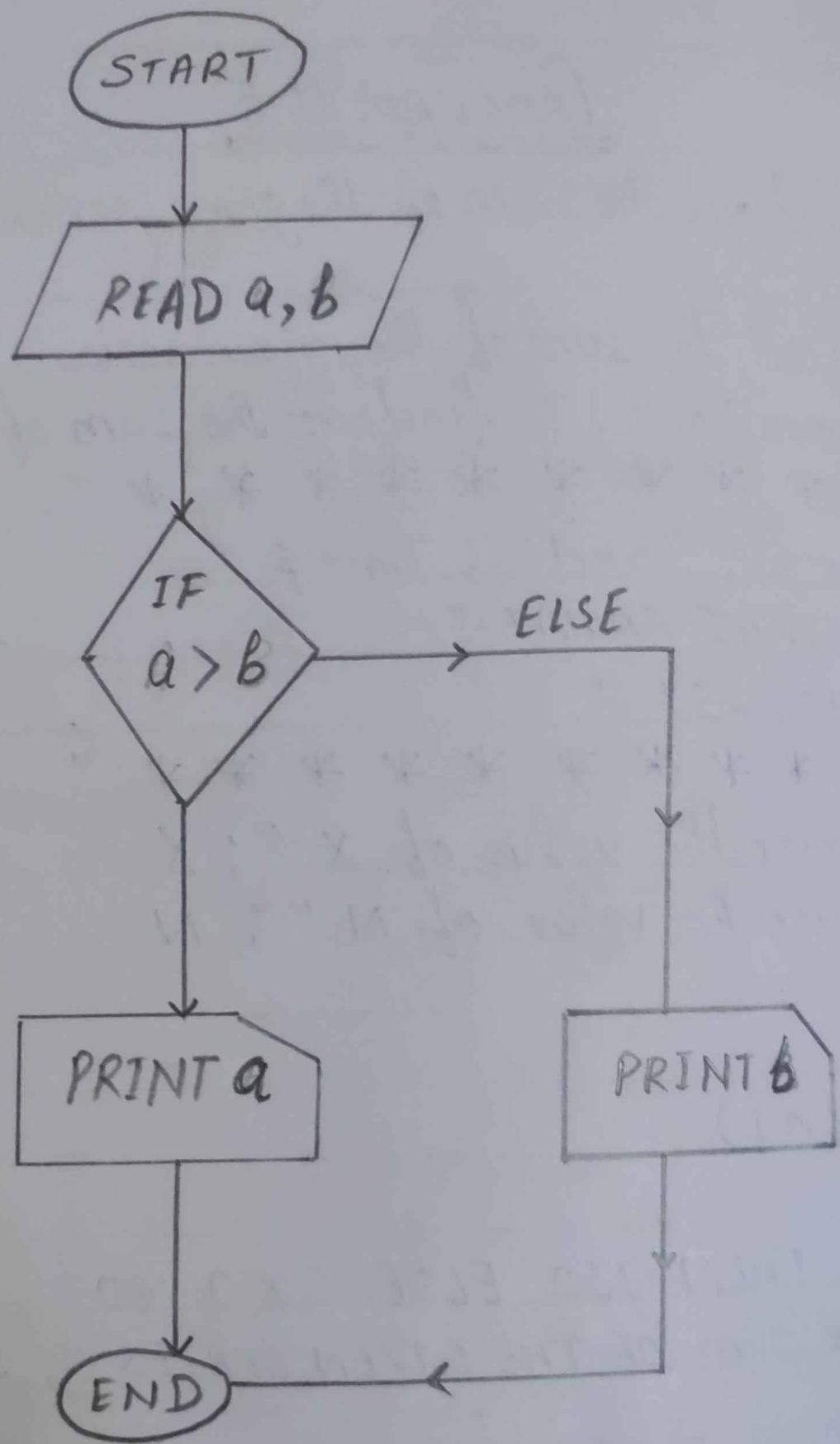
```

```
10 Cls
20 Rem To find the greater number between two
30 Print "PROGRAM NO.6: To find the greater number between two"
40 Print ****
60 Print Date$; "and"; Time$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print ****
100 Read A, B
110 Data 865,845
120 If A > B Then 130 Else GoTo 140
130 Print "The greater no. between two is"; A: GoTo 150
140 Print "The greater no. between two is "; B
150 End
```

PROGRAM NO.6: To find the greater number between two

04-23-2024 and 21:56:56
DEVRAJ RAWAT
2131231

The greater no. between two is 865



PROGRAM #7

Program to find out the greater no. among the three

```
10 CLS
20 REM To find out the greater no. among the three
30 PRINT "Program No. 7: To find out the greater no. among the given three"
40 PRINT "***** * * *"
50 PRINT Date $; " and "; Time $
60 PRINT "DEVRAJ RAWAT"
70 PRINT "2131231"
80 PRINT "***** * * *"
90 READ A, B, C
100 IF A > B THEN 110 ELSE GOTO 120
110 IF A > C THEN 130 ELSE GOTO 150
120 IF B > C THEN 140 ELSE GOTO 150
130 PRINT "The greatest no. among the three is "; A : GOTO 170
140 PRINT "The greatest no. among the three is "; B : GOTO 170
150 PRINT "The greatest no. among the three is "; C
160 DATA 765, 746, 787
170 END
```

*Runing
Date 20/03/2024*

10 Cls

20 Rem To find the greater number among three.

30 Print "PROGRAM NO.7: To find the greater number among three"

40 Print "*****

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****

100 Read A, B, C

110 If A > B Then 120 Else GoTo 130

120 If A > C Then 140 Else GoTo 160

130 If B > C Then 150 Else GoTo 120

140 Print "The greatest no. among three is"; A: GoTo 180

150 Print "The greatest no. among three is"; B: GoTo 180

160 Print "The greatest no. among three is"; C

170 Data 765,746,787

180 End

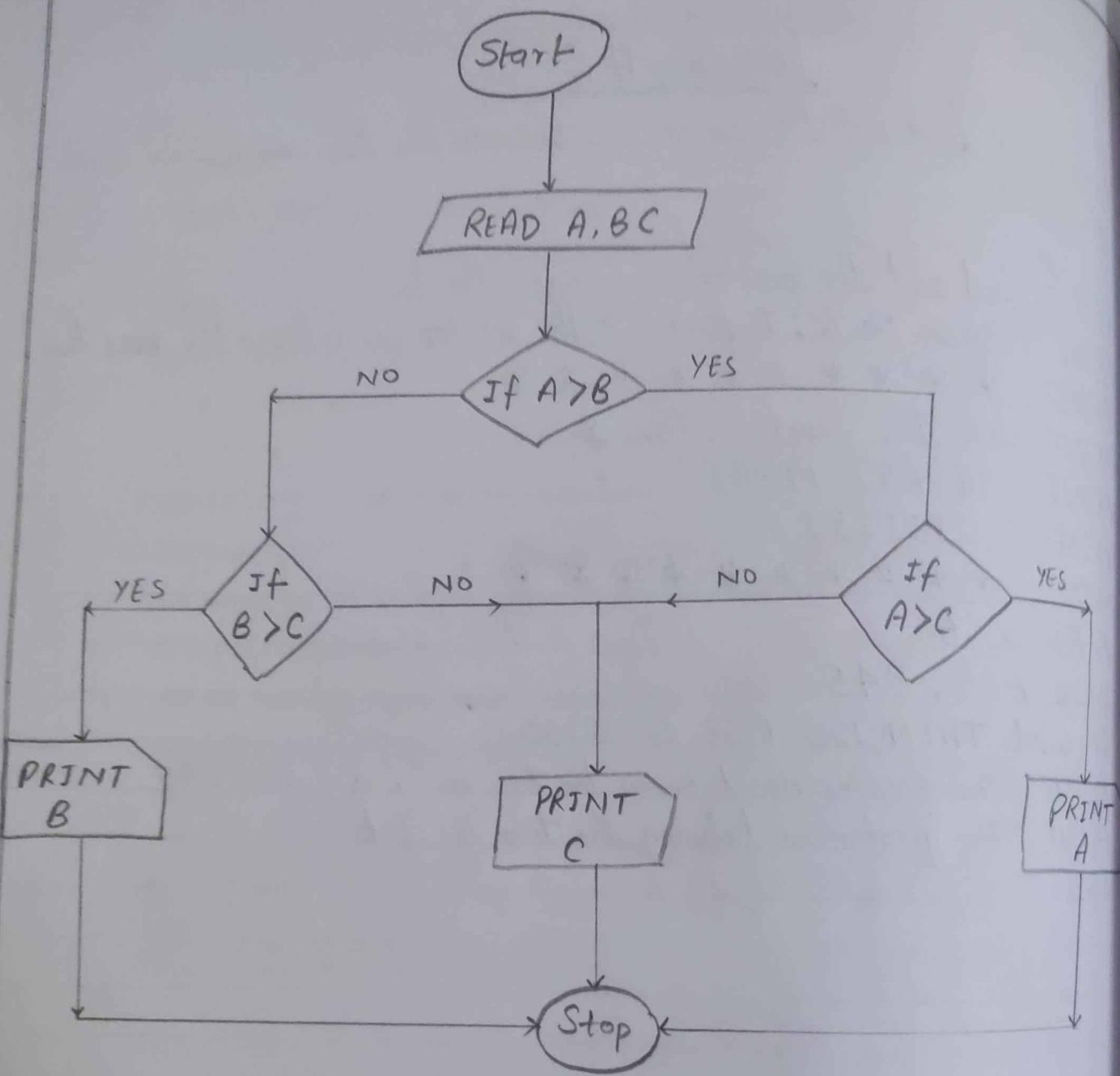
PROGRAM NO.7: To find the greater number among three

04-23-2024 and 22:53:09

DEVRAJ RAWAT

2131231

The greatest no. among three is 787



PROGRAM #8

Program to find out the roots of a quadratic equation

```

10 CLS
20 REM To find out the roots of a quadratic equation
30 PRINT "Program No. 8 : To find out the roots of a quadratic equation"
40 PRINT "*****"
50 PRINT Date$; " and "; Time$
60 PRINT "DEVRAJ RAWAT"
70 PRINT "2131231"
80 PRINT "*****"
90 INPUT "Enter the value of a "; a
100 INPUT "Enter the value of b "; b
110 INPUT "Enter the value of c "; c
130 D = (b * b) - 4 * a * c
140 IF D < 0 THEN 170
150 IF D = 0 THEN 230
160 IF D > 0 THEN 200
170 LET R1 = (-b) / (2 * a)
180 LET I = SQR(-D) / (2 * a)
190 PRINT "Imaginary roots R1 = "; R1; "+ i"; I; " and R2 = "; R1; "- i";
    T: GOTO 250
200 LET R1 = (-b + SQR(D)) / (2 * a)
210 LET R2 = (-b - SQR(D)) / (2 * a)
220 PRINT "Real and unequal roots R1 = "; R1; " R2 = "; R2: GOTO 250
230 LET R1 = (-b) / (2 * a)
240 PRINT "Equal roots R1 = "; R1
250 END

```

10 Cls

20 Rem To find the roots of quadratic equation .

30 Print "PROGRAM NO.8: To find the roots of quadratic equation "

40 Print "*****"

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****"

100 Input "Enter the value of coefficient x^2 "; a

110 Input "Enter the value of coefficient x"; b

120 Input "Enter the value of constant "; c

130 D = (b ^ 2) - (4 * a * c)

140 If D > 0 Then GoTo 210

150 If D = 0 Then GoTo 250

160 If D < 0 Then GoTo 170

170 Let R1 = (-b) / (2 * a)

180 Let I = (Sqr(-D)) / (2 * a))

190 Print "Imaginary roots R1="; R1; "+I"; I; "And R2="; R1; "-I"; I

200 GoTo 270

210 R1 = (-b + Sqr(D)) / (2 * a)

220 R2 = (-b - Sqr(D)) / (2 * a)

230 Print "Real and Unequal Roots R1="; R1; "R2="; R2

240 GoTo 270

250 R1 = (-b) / (2 * a)

260 Print "Equal Roots R="; R1

270 End

PROGRAM NO.8: To find the roots of quadratic equation

04-23-2024and23:06:54

DEVRAJ RAWAT

2131231

Enter the value of coefficient x^2 ? 1

Enter the value of coefficient x? 0

Enter the value of constant ? 4

Imaginary roots R1= 0 +1 2 And R2= 0 -1 2

PROGRAM NO.8: To find the roots of quadratic equation

04-23-2024and23:07:55

DEVRAJ RAWAT

2131231

Enter the value of coefficient x^2 ? 1

Enter the value of coefficient x? 4

Enter the value of constant ? 4

Equal Roots R=-2

PROGRAM NO.8: To find the roots of quadratic equation

04-23-2024and23:09:04

DEVRAJ RAWAT

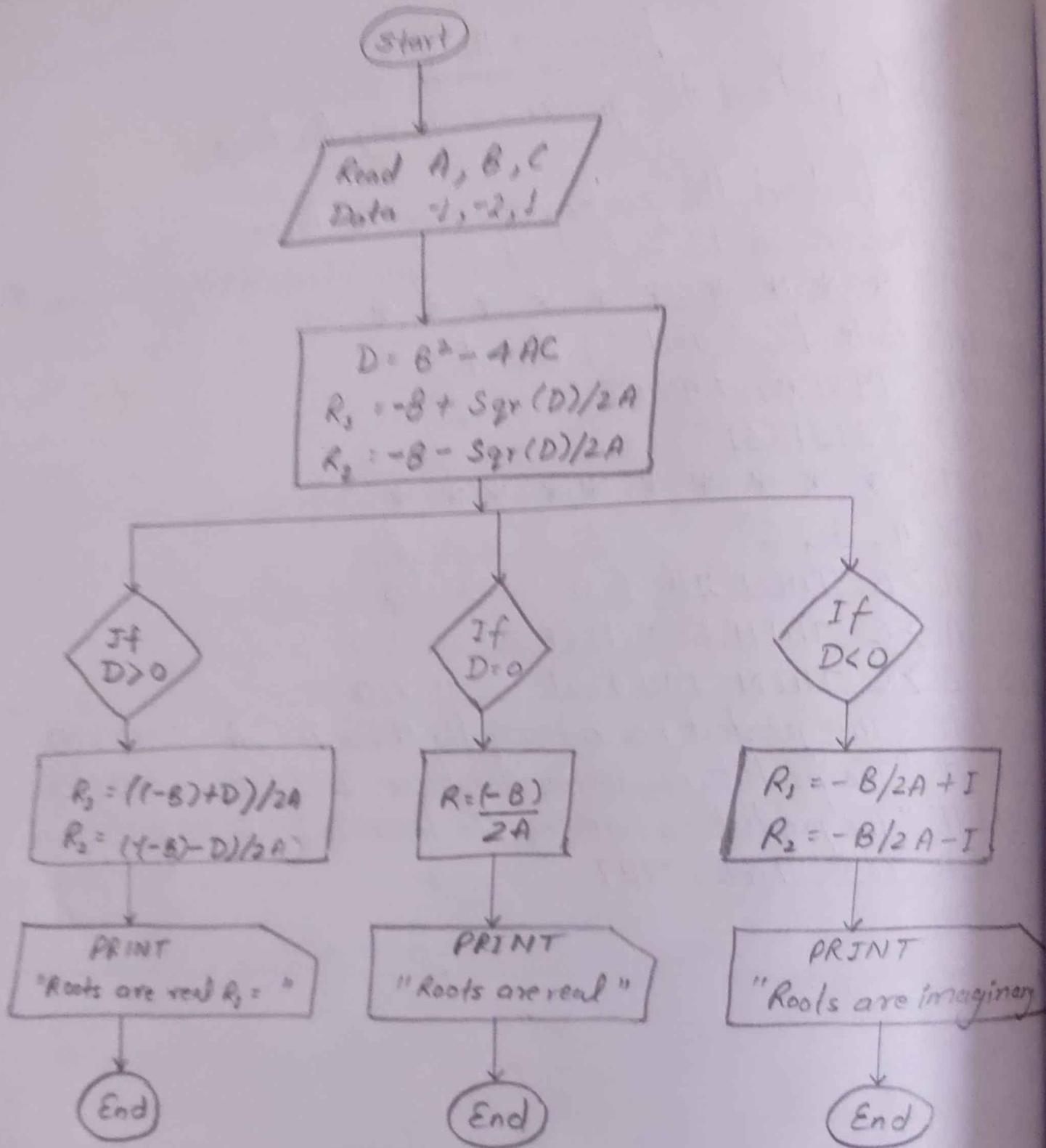
2131231

Enter the value of coefficient x^2 ? 1

Enter the value of coefficient x? 0

Enter the value of constant ? -4

Real and Unequal Roots R1= 2 R2=-2



PROGRAM #9

Program to find the sum & product of first n natural numbers using FOR NEXT command.

```

10 CLS
20 REM To find the sum and product of first n natural numbers.
30 PRINT "Program No. 9 : To find the sum and product of first n
natural numbers"
40 PRINT "*****"
50 PRINT Date$; "and"; Time$
60 PRINT "DEVRAJ RAWAT"
70 PRINT "2131231"
80 PRINT "*****"
90 INPUT "Enter the value of n "; n
100 LET S = 0
110 LET P = 1
120 FOR i = 1 TO n
130 LET S = S + i
140 LET P = P * i
150 NEXT i
155 PRINT "The sum & Product of n natural numbers are "; s; "& "; p;
      "respectively."
160 END

```

10 Cls

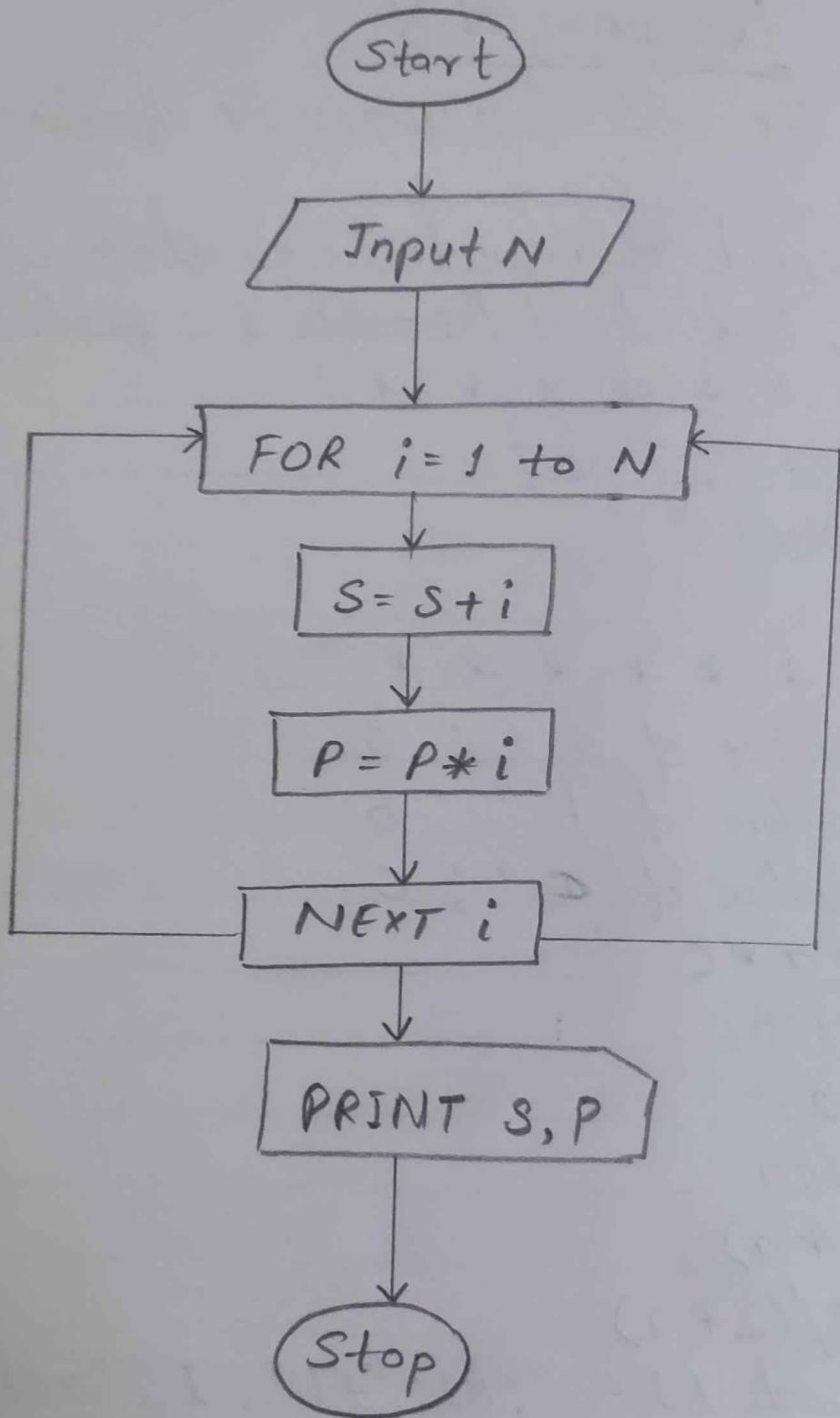
20 Rem To find the sum and product of n natural number using FOR-NEXT statement .
30 Print "PROGRAM NO.9:To find the sum and product of n natural number using FOR-NEXT statement"
40 Print "*****"
60 Print Date\$; "and"; Time\$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print "*****"
100 Input "Enter the value of n ="; n
110 Let S = 0
120 Let P = 1
130 For I = 1 To n
140 Let S = S + I
150 Let P = P * I
160 Next I
170 Print "The sum and product of n natural numbers are "; S; "and"; P; "respectively"
180 End

✓

PROGRAM NO.9:To find the sum and product of n natural number using FOR-NEXT stat
ement

04-23-2024 and 23:16:47
DEVRAJ RAWAT
2131231

Enter the value of n =? 7
The sum and product of n natural numbers are 28 and 5040 respectively



PROGRAM #10

Program to find the factorial of the given number

```
10 CLS
20 REM To find the factorial of the given number
30 PRINT "Program No. 10 : To find the factorial of the given number"
40 PRINT "*****"
50 PRINT Date$; "and"; Time$
60 PRINT "DEVRAJ RAWAT"
70 PRINT "2131231"
80 PRINT "*****"
90 INPUT "Enter the number whose factorial you want"; n
100 LET F = 1
110 FOR i = n TO 1 STEP -1
120 LET F = F * i
130 NEXT i
140 PRINT "The factorial of the given number is"; F
150 END
```

10 Cls

20 Rem To find the factorial of given number using FOR-NEXT statement .

30 Print "PROGRAM NO.10:To find the factorial of number using FOR-NEXT statement "

40 Print "*****"

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****"

100 Input "Enter the value whose value want n"; n

110 Let F = 1

120 For I = n To 1 Step -1

130 Let F = F * I

140 Next I

82 ✓

150 Print "the factorial of given number is "; F

160 End

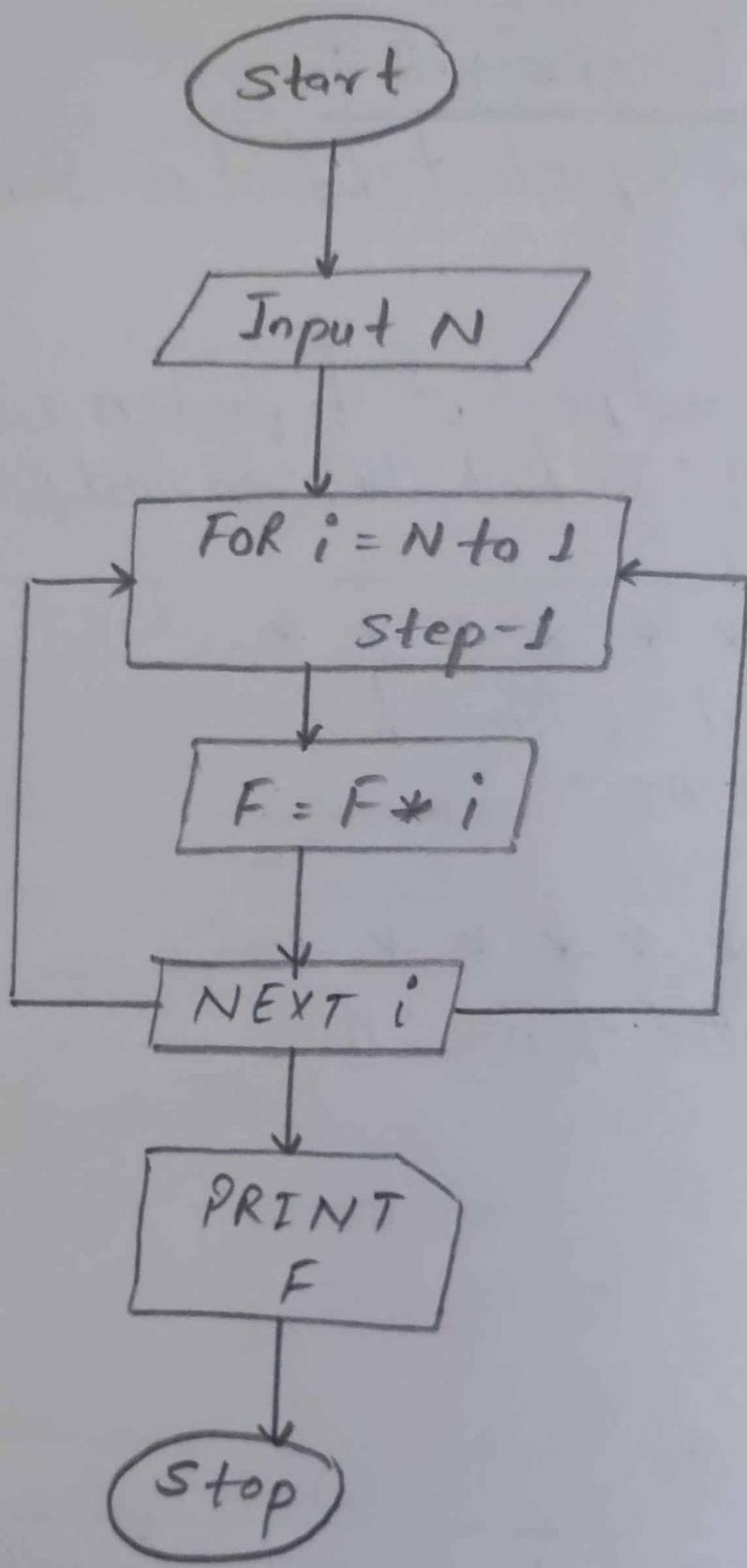
PROGRAM NO.10:To find the factorial of number using FOR-NEXT statement

04-23-2024 and 23:20:47

DEVRAJ RAWAT

2131231

Enter the value whose value want n? 10
the factorial of given number is 3628800



PROGRAM # 11

Program to find out the sum of the given series using FOR NEXT command

```

10 CLS
20 REM To find the sum of the given series
30 PRINT "Program No. 11 : To find the sum of the given series"
40 PRINT "*****"
50 PRINT Date $; "and"; Time $
60 PRINT " DEVRAJ RAWAT "
70 PRINT " 2131231 "
80 PRINT "*****"
90 INPUT "Enter the value of n "; n
95 INPUT "Enter the value of x "; x
100 LET S = 0
120 FOR i = 0 TO n
130 LET S = S + (x * i)
150 NEXT i
155 PRINT "The sum of the given series is "; S
160 END

```

Flow chart
Input 21

10 Cls

20 Rem To find the sum of given series ($1+x+x^2+\dots+x^n$) using FOR-NEXT statement.

30 Print "PROGRAM NO.11:To find the sum of given series ($1+x+x^2+\dots+x^n$) using FOR-NEXT statement."

40 Print "*****"

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****"

100 Input "Enter the value of n "; n

110 Input "Enter the value of x"; x

120 Let S = 0

130 For I = 0 To n

140 Let S = S + (x ^ I)

150 Next I

160 Print "The sum of the given series is"; S

170 End

PROGRAM NO.11:To find the sum of given series ($1+x+x^2+\dots+x^n$) using FOR-NEXT statement.

04-23-2024 and 23:24:59

DEVRAJ RAWAT

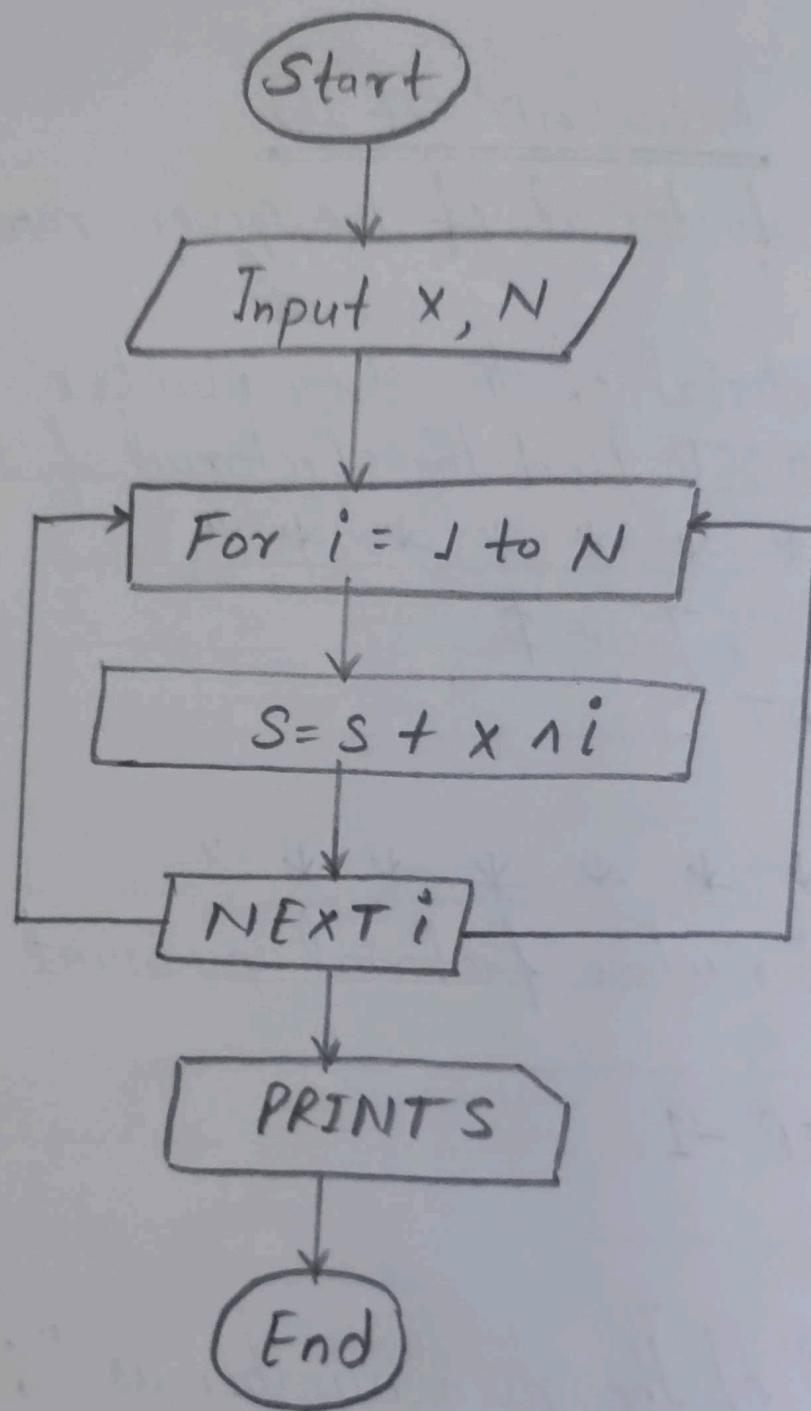
2131231

Enter the value of n ? 5

Enter the value of x? 6

The sum of the given series is 9331

132



Expt. No.

PROGRAM #12

Program to find out the average of given data set

10. CLS

20 REM To find out the average of given data set

30 PRINT "PROGRAM NO. 12 : To find out the average of given data set."

~~Incomplete~~
24/4/24

40 PRINT "***** * * * *"

60 PRINT Date \$; " and "; Time \$

70 PRINT "DEVRAJ RAWAT"

80 PRINT "2131231"

90 PRINT "***** * * * *"

100 LET S=0

110 LET N=0

120 DIM A(100)

130 FOR I=1 TO 6

140 READ A(I)

150 N=N+1

160 S=S+A(I)

170 NEXT I

180 DATA 10, 20, 30, 40, 50, 60

190 Average = S/N

200 PRINT "Average of given data set is "; Average

210 END

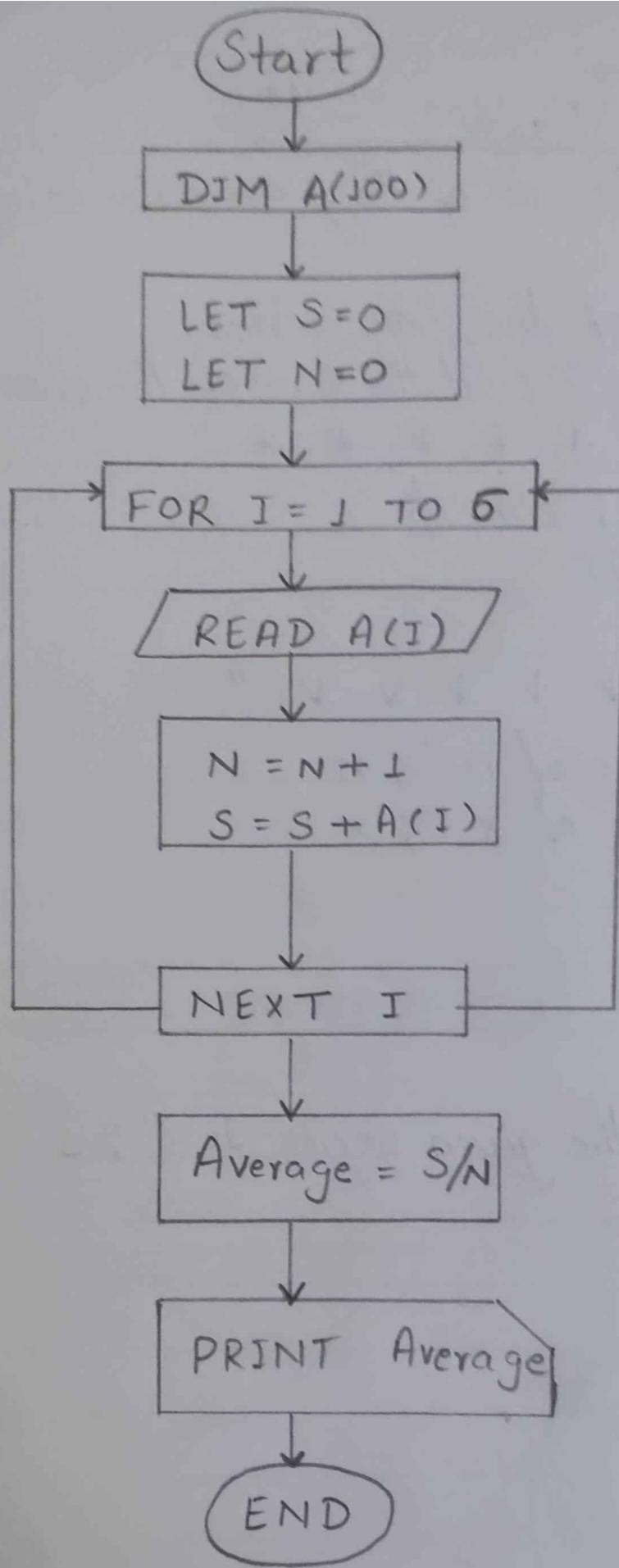
```
10 Cls  
20 Rem To find out the average of given data set .  
30 Print "PROGRAM NO.12:To find out the average of given data set ."  
40 Print "*****  
60 Print Date$; "and"; Time$  
70 Print "DEVRAJ RAWAT"  
80 Print "2131231"  
90 Print "*****  
100 Let S = 0  
110 Let N = 0  
120 Dim A(100)  
130 For I = 1 To 6  
140 Read A(I)  
150 N = N + 1  
160 S = S + A(I)  
170 Next I  
180 Data 10,20,30,40,50,60  
190 Average = S / N  
200 Print "Average of given data set is "; Average  
210 End
```

PROGRAM NO.12:To find out the average of given data set

04-26-2024 and 19:28:04
DEVRAJ RAWAT
2131231

Average of given data set is 35

for



Expt. No. _____

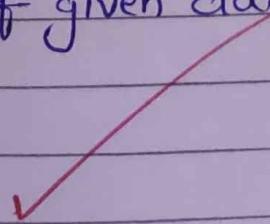
PROGRAM # 13

Program to find out the standard deviation of given data set.

```

100 LET S=0
110 LET N=0
120 LET M=0
130 LET P=0
140 DIM A(100)
150 FOR I = 1 TO 7
160 READ A(I)
161 N = N + 1
164 S = S + A(I)
170 NEXT I
180 DATA 10, 20, 30, 40, 50, 60, 70
190 Average = S/N
200 FOR J = 1 TO 7
210 M = (A(J) - Average) ^ 2
220 P = P + M
230 NEXT J
240 S.D. = P/(N-1)
250 PRINT "The standard deviation of given data set is "; S.D.
260 PRINT "The average of given data set is "; Average
270 END

```



10 Cls

20 Rem To find out the standard deviation of given data set .

30 Print "PROGRAM NO.13:To find out the standard deviation of given data set ."

40 Print "*****

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****

100 Let S = 0

110 Let N = 0

120 Let M = 0

130 Let P = 0

140 Dim A(100)

150 For I = 1 To 7

160 Read A(I)

162 N = N + 1

164 S = S + A(I)

170 Next I

180 Data 10,20,30,40,50,60,70

190 Average = S / N

200 For I = 1 To 7

210 M = (A(I) - Average) ^ 2

220 P = P + M

230 Next I

240 S.D = P / (N - 1)

250 Print "The standard deviation of given data set is"; S.D

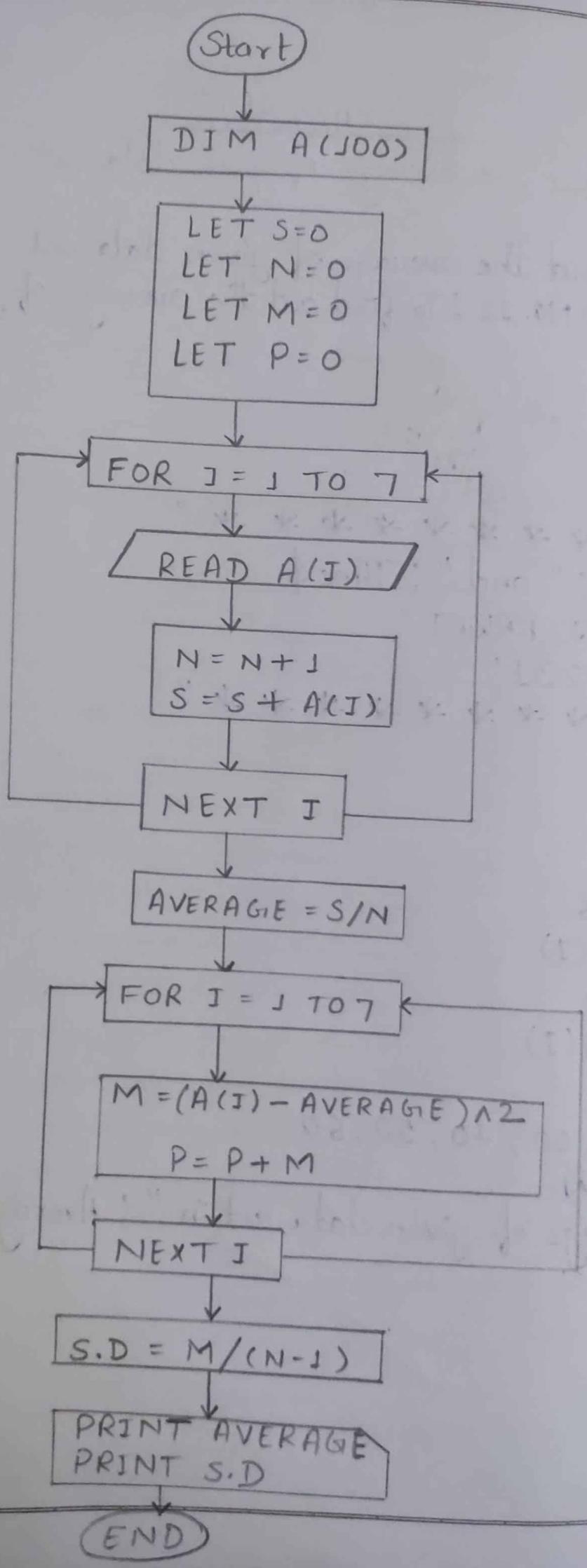
260 Print "The average of given data set is"; Average

270 End

PROGRAM NO.13:To find out the standard deviation of given data set .

04-26-2024and19:35:27
DEURAJ RAWAT
2131231

The standard deviation of given data set is 166.666?
The average of given data set is 40

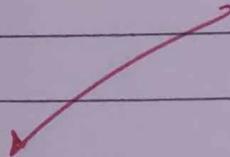


Expt. No.

PROGRAM #14

Program to find the fibonacci series

```
100 INPUT "Enter the no. upto which we want the fibonacci series "; n
110 LET t1=0
120 PRINT t1;
130 LET t2=1
140 PRINT t2;
142 LET F=0
145 FOR I = 1 TO n
150 F = t1 + t2
160 t1 = t2
180 t2 = F
185 PRINT F;
190 NEXT I
20 END
```



10 Cls

20 Rem To find the fibonacci series .

30 Print "PROGRAM NO.14:To find the fibonacci series ."

40 Print "*****

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****

100 Input "Enter the no. upto which we want the fibonacci series"; n

110 Let t1 = 0

120 Print t1;

130 Let t2 = 1

140 Print t2;

142 Let F = 0

145 For I = 1 To n

150 F = t1 + t2

160 t1 = t2

180 t2 = F

185 Print F;

190 Next I

210 End

PROGRAM NO.14:To find the fibonacci series .

04-26-2024 and 19:42:29

DEVR AJ RAWAT

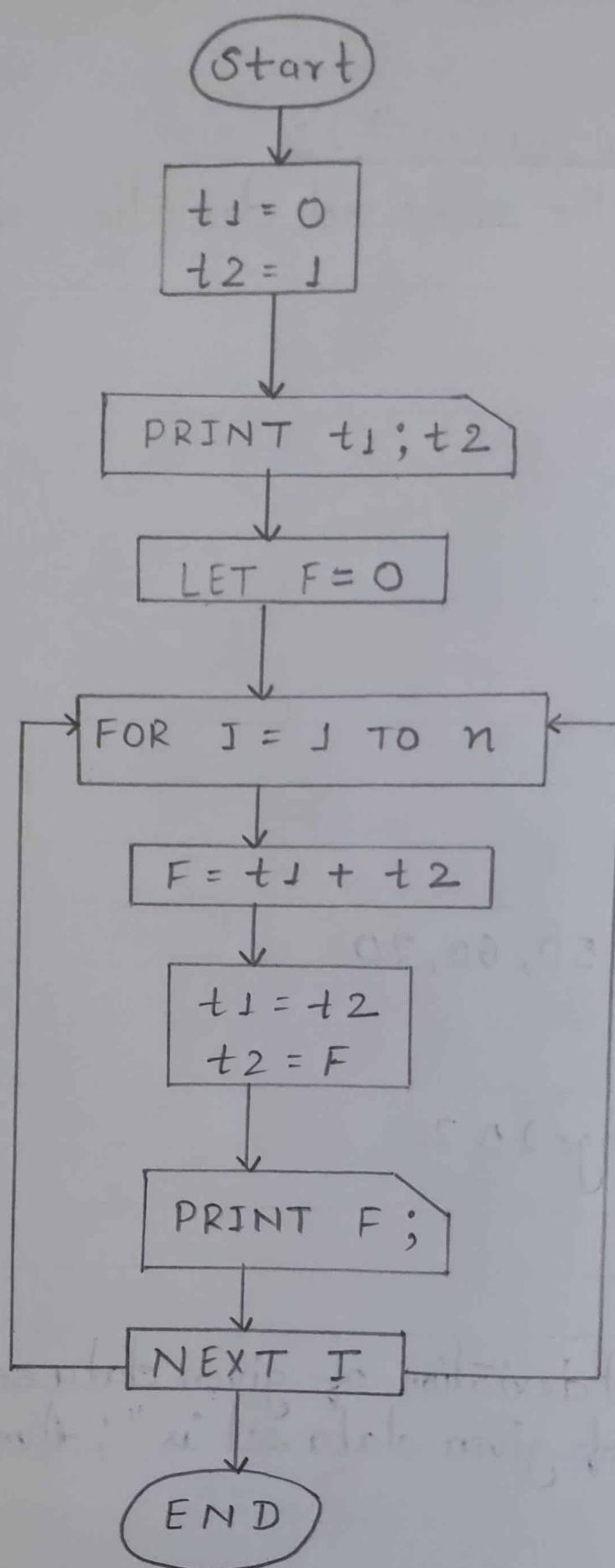
2131231

Enter the no. upto which we want the fibonacci series? 20

0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584

4181 6765 10946

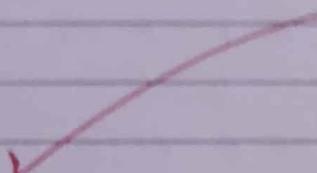
✓
RBS



PROGRAM II-14(A)

* Program to find the fibonacci series using Array.

```
100 INPUT "Enter the number upto which we want fibonacci series"; n  
110 DIM A(n)  
120 t1 = 0  
130 t2 = 1  
140 A(1) = t1  
150 A(2) = t2  
160 PRINT A(1); A(2);  
170 FOR I = 3 TO n  
180 A(I) = A(I-1) + A(I-2)  
190 PRINT A(I);  
200 NEXT I  
210 END
```



10 Cls

20 Rem To find the fibonacci series using array

30 Print "PROGRAM NO.14 A:To find the fibonacci series using array "

40 Print "*****

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****

100 Input "Enter the number upto which we want fibonacci series"; n

110 Dim A(n)

120 t1 = 0

130 t2 = 1

140 A(1) = t1

150 A(2) = t2

160 Print A(1); A(2);

170 For I = 3 To n

180 A(I) = A(I - 1) + A(I - 2)

190 Print A(I);

200 Next I

210 End

PROGRAM NO.14 A:To find the fibonacci series using array

04-26-2024 and 19:55:06

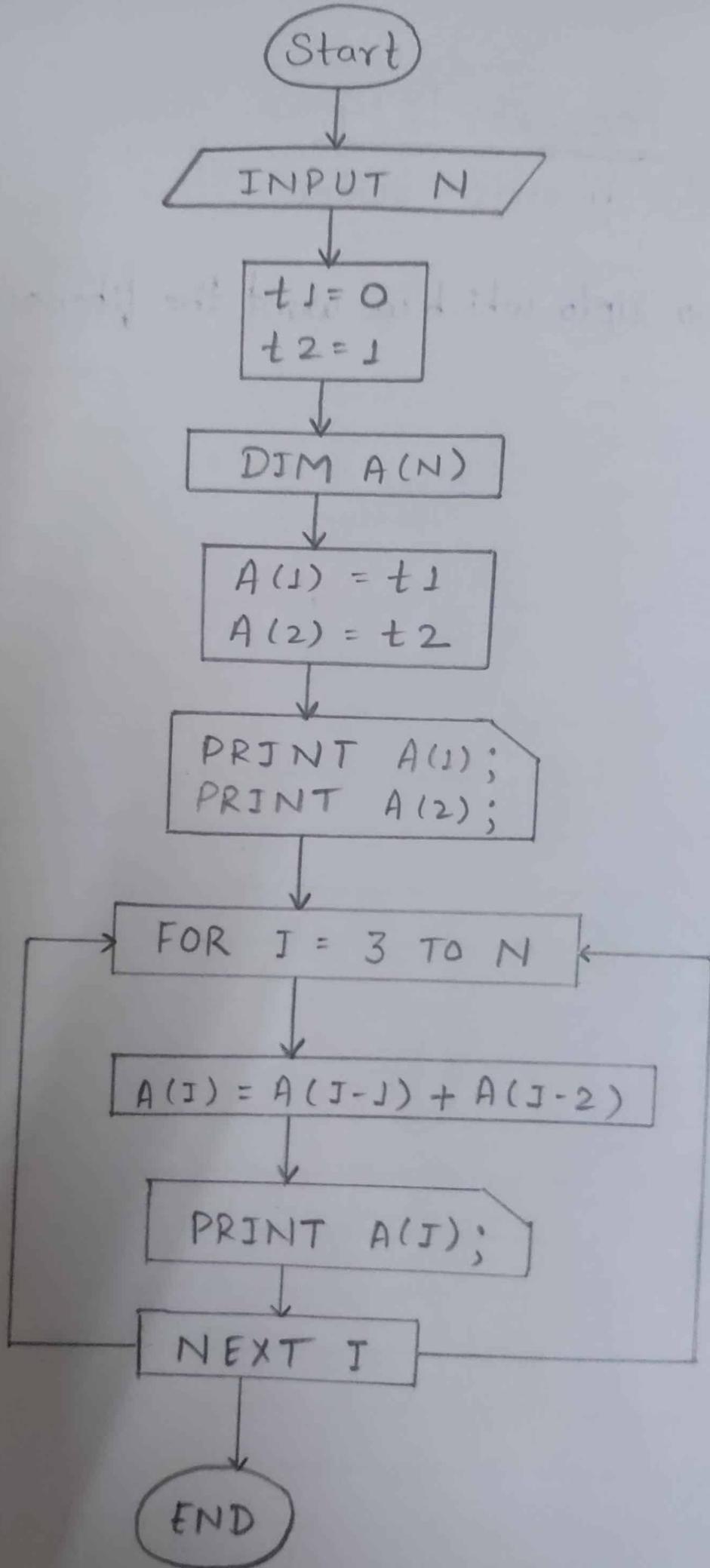
DEVR AJ RAWAT

2131231

Enter the number upto which we want fibonacci series? 20

0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584

4161



PROGRAM \Rightarrow 15

Program to find the sum, difference and multiplication of two Matrices

100 DIM A(2,2), B(2,2), C(2,2), D(2,2), E(2,2)

110 NR=2

120 NC=2

115 PRINT "Matrix A is "

116 FOR I=1 TO NR

118 FOR J=1 TO NC

120 READ A(I,J)

125 PRINT A(I,J);

130 NEXT J

135 PRINT

140 NEXT I

142 DATA 2, 3, 5, 1

145 PRINT "Matrix B is "

146 FOR I=1 TO NR

147 FOR J=1 TO NC

148 READ B(I,J)

150 PRINT B(I,J);

155 NEXT J

160 PRINT

165 NEXT I

170 DATA 11, 15, 10, 25

175 PRINT " THE SUM OF MATRICES , (C=B+A) IS "

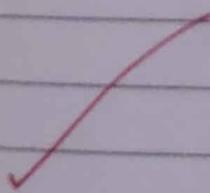
180 FOR I=1 TO NR

185 FOR J=1 TO NC

190 200 C(I,J) = B(I,J) + A(I,J)

210 PRINT C(I,J);

```
215 NEXT J
220 PRINT
225 NEXT I
235 PRINT "THE DIFFERENCE OF MATRICES, (D= B-A) IS"
240 NR = 2
245 NC = 2
250 FOR I = 1 TO NR
255 FOR J = 1 TO NC
260 FOR D(I,J) = B(I,J) - A(I,J)
265 PRINT D(I,J);
270 NEXT J
275 PRINT
280 NEXT J
285 PRINT "MATRIX E = A * B = "
300 FOR I = 1 TO NR
305 FOR J = 1 TO NC
310 E(I,J) = A(I,J) * B(I,J)
314 PRINT E(I,J);
315 NEXT J
320 PRINT
325 NEXT I
330 END.
```



```
20 Rem To find the sum, difference and multiplication of two Matrices
30 Print "PROGRAM NO.15 To find the sum , difference AND multiplication of two Matrices"
40 Print "*****"
60 Print Date$, "and"; Time$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print "*****"
100 Dim A(2, 2), B(2, 2), C(2, 2), D(2, 2), E(2, 2)
110 NR = 2
112 NC = 2
115 Print "Matrix A is"
116 For I = 1 To NR
    118 For J = 1 To NC
        120 Read A(I, J)
        125 Print A(I, J);
    130 Next J
    135 Print
140 Next I
142 Data 2,3,5,1
145 Print "Matrix B is"
146 For I = 1 To NR
    147 For J = 1 To NC
        148 Read B(I, J)
        150 Print B(I, J);
    155 Next J
    160 Print
165 Next I
170 Data 11,15,10,25
175 Print "THE SUM OF MATRICES,(C=B+A) IS"
190 For I = 1 To NR
    195 For J = 1 To NC
```

✓✓

200 $C(I, J) = B(I, J) + A(I, J)$
210 Print $C(I, J);$
215 Next J
220 Print
225 Next I
235 Print "THE DIFFERENCE OF MATRICES,(D=B-A) IS"
240 NR = 2
245 NC = 2
250 For I = 1 To NR
255 For J = 1 To NC
260 $D(I, J) = B(I, J) - A(I, J)$
265 Print $D(I, J);$
270 Next J
275 Print
280 Next I
285 Print "MATRIX E=A*B ="
300 For I = 1 To NR
305 For J = 1 To NC
310 $E(I, J) = A(I, J) * B(I, J)$
314 Print $E(I, J);$
315 Next J
320 Print
325 Next I
330 End

PROGRAM NO. 15 To find the sum , difference and multiplication of two Matrices

04-26-2021 and 07-07-93

DEURAJ RAJU

2131231

Matrix A is

2 3
5 1

Matrix B is

11 15
10 25

THE SUM OF MATRICES, (C=B+A) IS

13 16
15 26

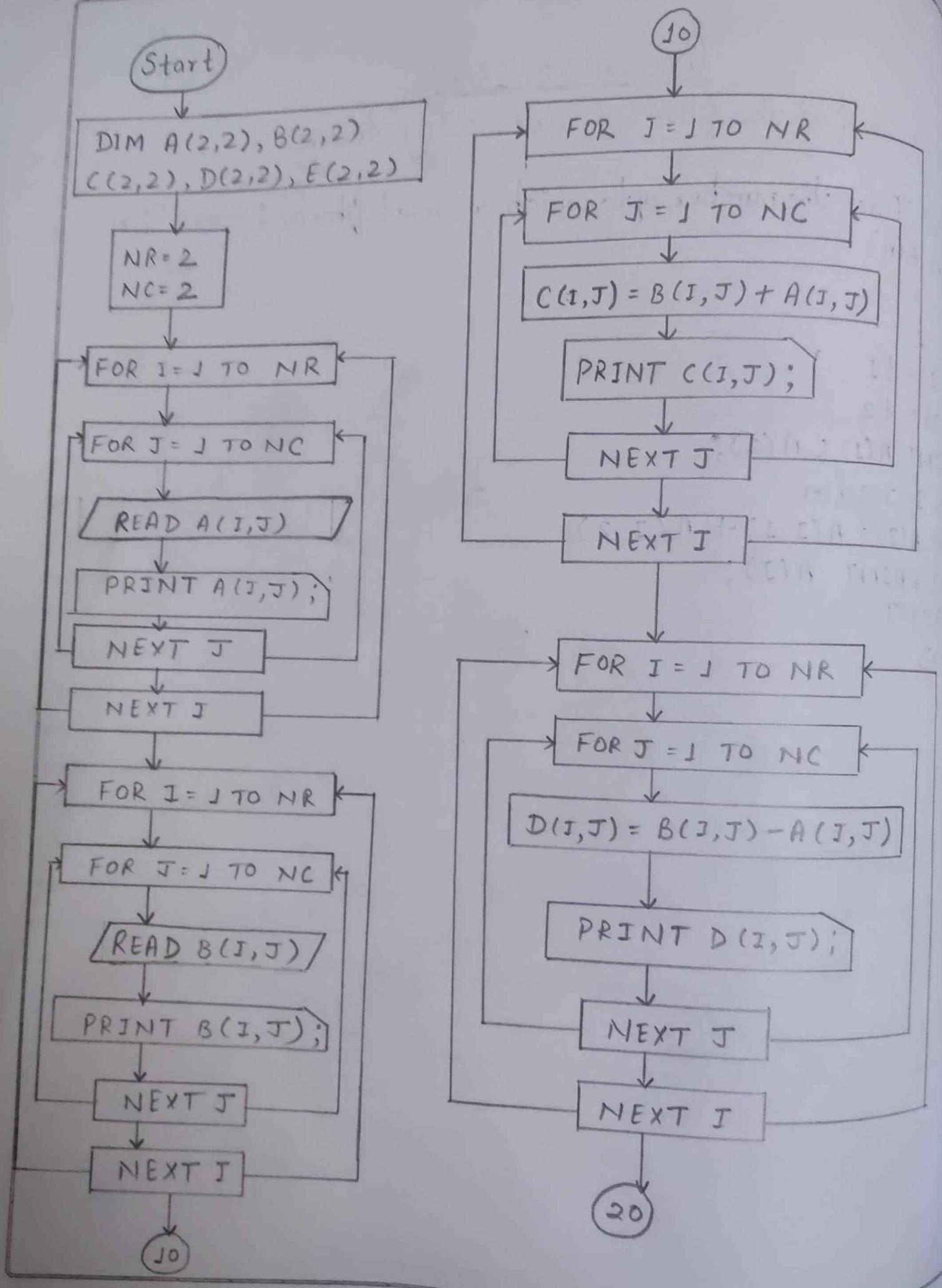
THE DIFFERENCE OF MATRICES, (D=B-A) IS

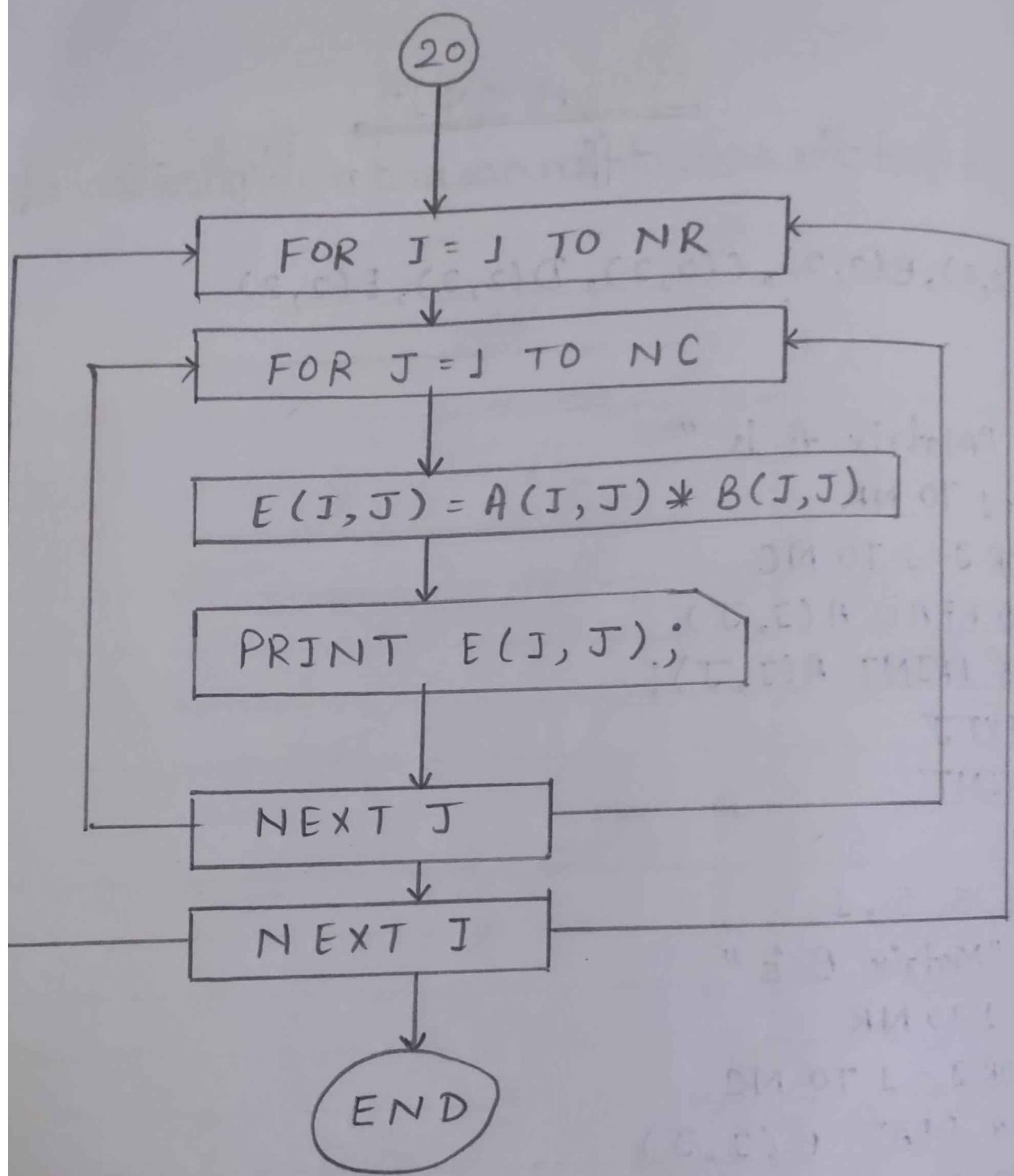
9 12
5 24

MATRIX E=A*B =

22 45
50 25







Expt. No.

PROGRAM #16

Program to read and print a matrix and it's transpose.

```
100 DIM A(3,3), B(3,3)
```

```
110 NR=3
```

```
112 NC=3
```

```
115 PRINT "Matrix A is "
```

```
116 FOR I = 1 TO NR
```

```
118 FOR J = 1 TO NC
```

```
120 READ A(I,J)
```

```
125 PRINT A(I,J);
```

```
130 NEXT J
```

```
135 PRINT
```

```
140 NEXT J
```

```
142 DATA 6,5,8,3,7,5,7,7,2
```

```
145 PRINT "THE TRANPOSE OF MATRIX A IS MATRIX B = "
```

```
146 FOR I = 1 TO NR
```

```
147 FOR J = 1 TO NC
```

```
148 B(I,J) = A(J,I)
```

```
150 PRINT B(I,J);
```

```
155 NEXT J
```

```
160 PRINT
```

```
165 NEXT I
```

```
170 END
```

10 Cls
20 Rem TO READ AND PRINT A MATRIX AND IT'S TRANSPOSE
30 Print "PROGRAM NO.16: TO READ AND PRINT A MATRIX AND IT'S TRANSPOSE ."
40 Print "*****"
60 Print Date\$; "and"; Time\$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print "*****"
100 Dim A(3, 3), B(3, 3)
110 NR = 3
112 NC = 3
115 Print "Matrix A is "
116 For I = 1 To NR
118 For J = 1 To NC
120 Read A(I, J)
125 Print A(I, J);
130 Next J
135 Print
140 Next I
142 Data 6,5,8,3,7,5,7,7,2
145 Print "THE TRANSPOSE OF MATRIX A IS MATRIX B ="
146 For I = 1 To NR
147 For J = 1 To NC
148 B(I, J) = A(J, I)
150 Print B(I, J);
155 Next J
160 Print
165 Next I
170 End

RR✓

PROGRAM NO. 16 TO READ AND PRINT A MATRIX AND IT'S TRANSPOSE

DATE : 10/10/17 : 10:52
DEPARTMENT : COMPUTER SCIENCE

MATRIX A :

6	5	8
3	7	5
7	7	2

THE TRANSPOSE OF MATRIX A IS MATRIX B

6	3	7
5	7	7
8	5	2



PROGRAM # 17

Program to generate the table for volume vs pressure of an ideal gas

100 LET R = 0.0821

110 REM R IN L*atm/mol * K

120 INPUT "Enter the value of temperature and no. of moles"; T, n

130 PRINT "V(L)", "P(atm)"

140 FOR V = 1 TO 25 STEP 5

150 PRINT V, Pressure(V, n, R, T)

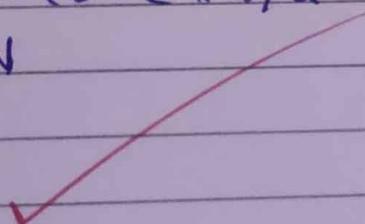
160 NEXT V

165 END

170 FUNCTION Pressure(a, b, c, d)

180 Pressure = (b * c * d) / a

190 END FUNCTION



```

10 Cls
20 Rem To generate the table for volume vs pressure of an ideal gas .
30 Print "PROGRAM NO.17:To generate the table for volume vs pressure of an ideal gas "
40 Print "*****"
60 Print Date$; "and"; Time$
70 Print "DVRAJ RAWAT"
80 Print "2131231"
90 Print "*****"
100 Let R = 0.0821
110 Rem R IN L*atm /mol*K
120 Input "Enter the value of temperature and no. of mole "; T, n
130 Print "V(L)", "P(atm)"
140 For V = 1 To 25 Step 5
150 Print V, Pressure(V, n, R, T)
160 Next V
165 End
170 Function Pressure (a, b, c, d)
180 Pressure = (b * c * d) / a
190 End Function

```

✓

```

PROGRAM NO.17:To generate the table for volume vs pressure of an ideal gas
*****  

04-26-2024and20:28:08  

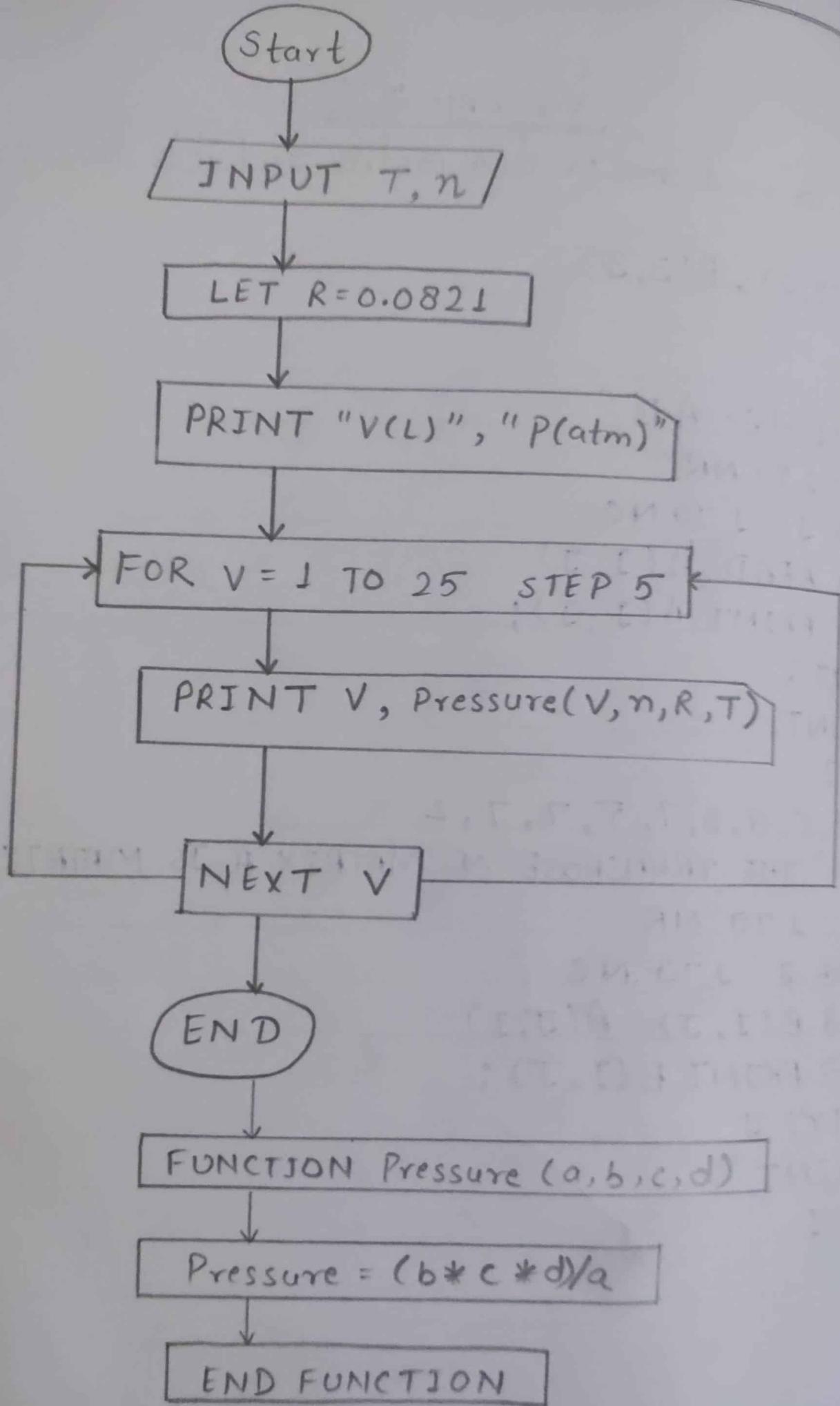
DVRAJ RAWAT  

2131231  

*****  

Enter the value of temperature and no. of mole ? 300,1
V(L)      P(atm)
1          24.63
6          4.105
11         2.239091
16         1.539375
21         1.172857

```



PROGRAM # 18

Program to calculate the combination using subroutine.

100 INPUT "Enter the value of n and r "; n, r

110 x = n

120 GO SUB 185

130 x = r

140 N1 = F

145 GO SUB 185

150 x = n - r

155 N2 = F

160 GO SUB 185

165 N3 = F

170 P = N1 / (N2 * N3)

175 PRINT "C("; n; ", "; r; ") is "; P

180 END

185 REM SUBROUTINE

190 F = 1

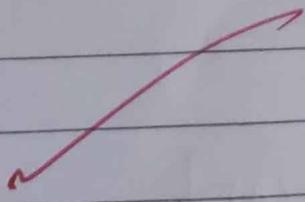
200 FOR I = x To 1 STEP -1

210 F = F * I

220 NEXT I

230 PRINT F

240 RETURN



```
10 Cls  
20 Rem To calculate the combination using subroutine .  
30 Print "PROGRAM NO.18:To calculate the combination using subroutine ."  
40 Print "*****  
60 Print Date$; "and"; Time$  
70 Print "DEVRAJ RAWAT"  
80 Print "2131231"  
90 Print "*****  
100 Input "Enter the value of n and r"; n, r  
110 x = n  
120 GoSub 185  
130 x = r  
140 N1 = F  
145 GoSub 185  
150 x = n - r  
155 N2 = F  
160 GoSub 185  
165 N3 = F  
170 P = N1 / (N2 * N3)  
175 Print " C("; n; ","; r; ")is"; P  
180 End  
185 Rem Subroutine  
190 F = 1  
200 For I = x To 1 Step -1  
210 F = F * I  
220 Next I  
230 Print F  
240 Return
```

80 ✓

PROGRAM NO.18:To calculate the combination using subroutine .

04-26-2024and20:37:10

DEVRAJ RAWAT

2131231

Enter the value of n and r? 6,5

720

120

1

C(6 , 5)is 6

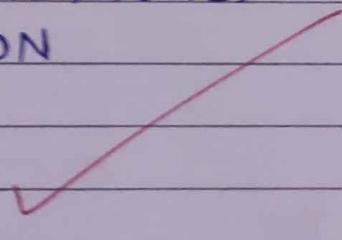
PROGRAM # 19

Program to calculate the root of given equation ($x^3 + x^2 - 1$) Using Iteration Method.

```

100 READ X0, E
110 I=1
120 X1 = F(X0)
125 PRINT I ; X1
130 IF ABS(X1-X0) <= E THEN GOTO 170
140 LET X0 = X1
150 I=I+1
160 GOTO 120
170 PRINT "THE ROOT OF THE GIVEN EQUATION IS "; X1 ; "AT ITERATION"; I
180 DATA 0.5, 0.0001
190 FUNCTION F(A)
200 F = (A-A^2)^1/3
210 END FUNCTION

```



10 Cls

20 Rem TO CALCULATE THE ROOT OF GIVEN EQUATION ($X^3 + X^2 - 1$) USING ITERATION METHOD

30 Print "PROGRAMNO.19:TO CALCULATE THE ROOT OF GIVEN EQUATION ($X^3 + X^2 - 1$) USING ITERATION METHOD"

40 Print "*****"

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print "*****"

100 Read XO, e

110 I = 1

120 XI = F(XO)

125 Print I; XI

130 If Abs(XI - XO) <= e Then GoTo 170

140 Let XO = XI

150 I = I + 1

160 GoTo 120

170 Print "THE ROOT OF THE GIVEN EQUATION IS"; XI; "AT IERATION"; I

180 Data 0.5,0.0001

190 Function F (A)

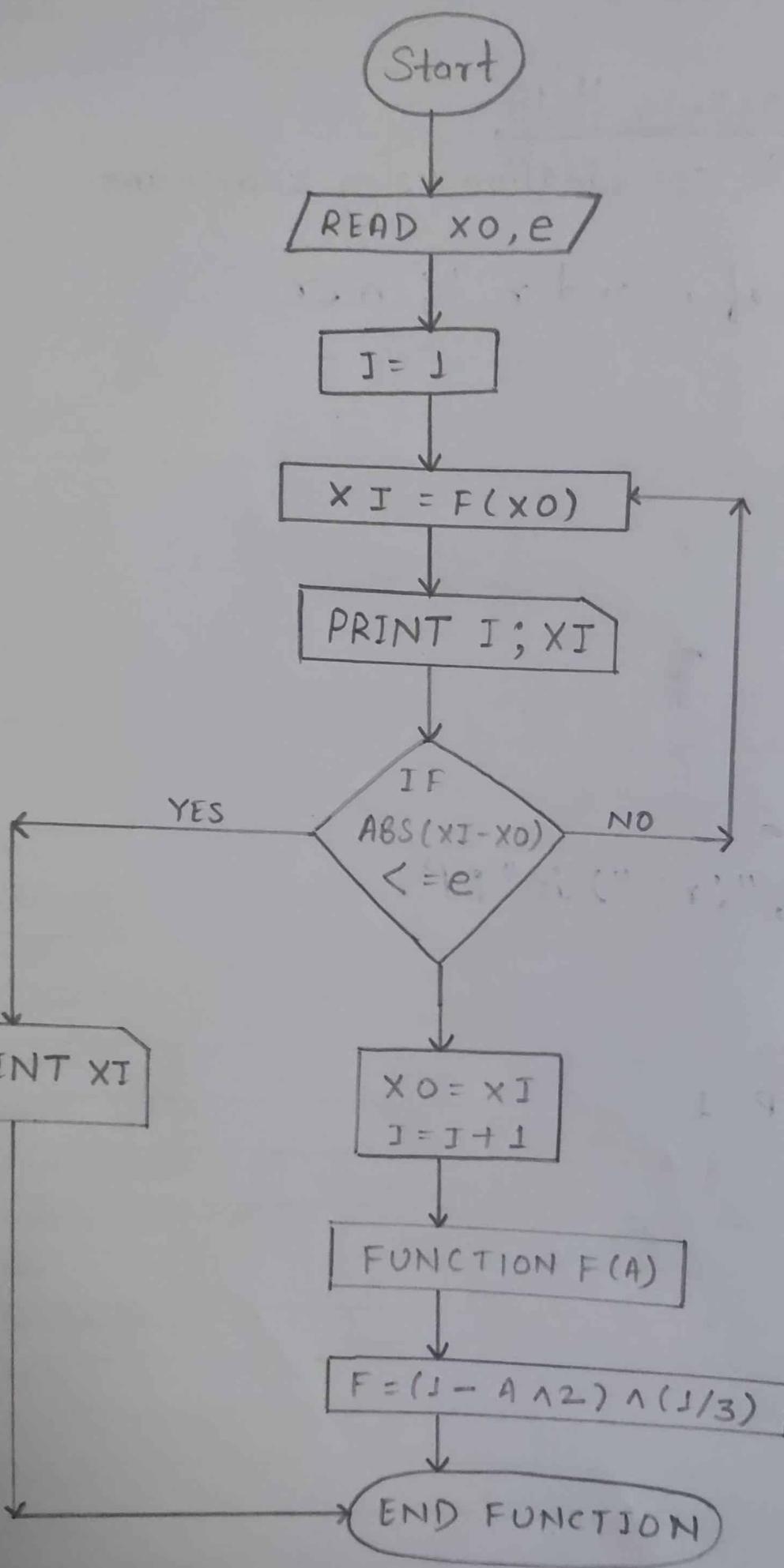
200 F = (1 - A ^ 2) ^ (1 / 3)

210 End Function

48 .7543032
49 .7553845
50 .7544296
51 .755273
52 .7545282
53 .7551861
54 .7546051
55 .7551183
56 .7546651
57 .7550653
58 .7547119
59 .7550241
60 .7547483
61 .7549918
62 .7547768
63 .7549667
64 .7547991
65 .7549471
66 .7548164
67 .7549318
68 .7548298
69 .7549199

100%

THE ROOT OF THE GIVEN EQUATION IS .7549199 AT IERATION 69



PROGRAM # 21

Program to find the sum of given series $\log(x+1) = x - (x^2/2) + (x^3/3) - \dots$

100 INPUT "Enter the value of X"; X

110 DIM A(100)

115 S = X

120 FOR I = 2 TO 50

125 A(I) = ((C-I)^(I-1)) * (X^I) / I

130 S = S + A(I)

135 IF ABS(A(I) - A(I-1)) < 0.001 THEN GOTO 145

140 NEXT I

145 PRINT "THE SUM OF THE SERIES = "; S; " WHICH CONVERGE TO ACTUAL VALUE IN "; I; " TERMS".

150 PRJNT "THE VALUE OF $\log(x+1)$ SERIES IS "; LOG(X+1)

160 END.

N

10 Cls

```
20 Rem To find the sum the sum of given series LOG(X+1)=X-(X^2/2)+(X^3/3)-.....
30 Print "PROGRAM NO.21 : To find the sum of given series LOG(X+1)=X-(X^2/2)+(X^3/3)-.....
40 Print ****
60 Print Date$; "and"; Time$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print ****
100 Input "Enter the value of X"; X
110 Dim A(100)
115 S = X
120 For I = 2 To 50
125 A(I) = (((-1) ^ (I - 1)) * (X ^ I)) / I
130 S = S + A(I)
135 If Abs(A(I) - A(I - 1)) < 0.001 Then GoTo 145
140 Next I
145 Print "THE SUM OF THE SERIES ="; S; "WHICH CONVERGE TO ACTUAL VALUE IN "; I; "TERMS "
150 Print "THE VALUE OF LOG(X+1) SERIES IS ="; Log(X + 1)
160 End
```

PROGRAM NO.21 : To find the sum of given series LOG(X+1)=X-(X^2/2)+(X^3/3)-.....

04-28-2024 and 17:22:45

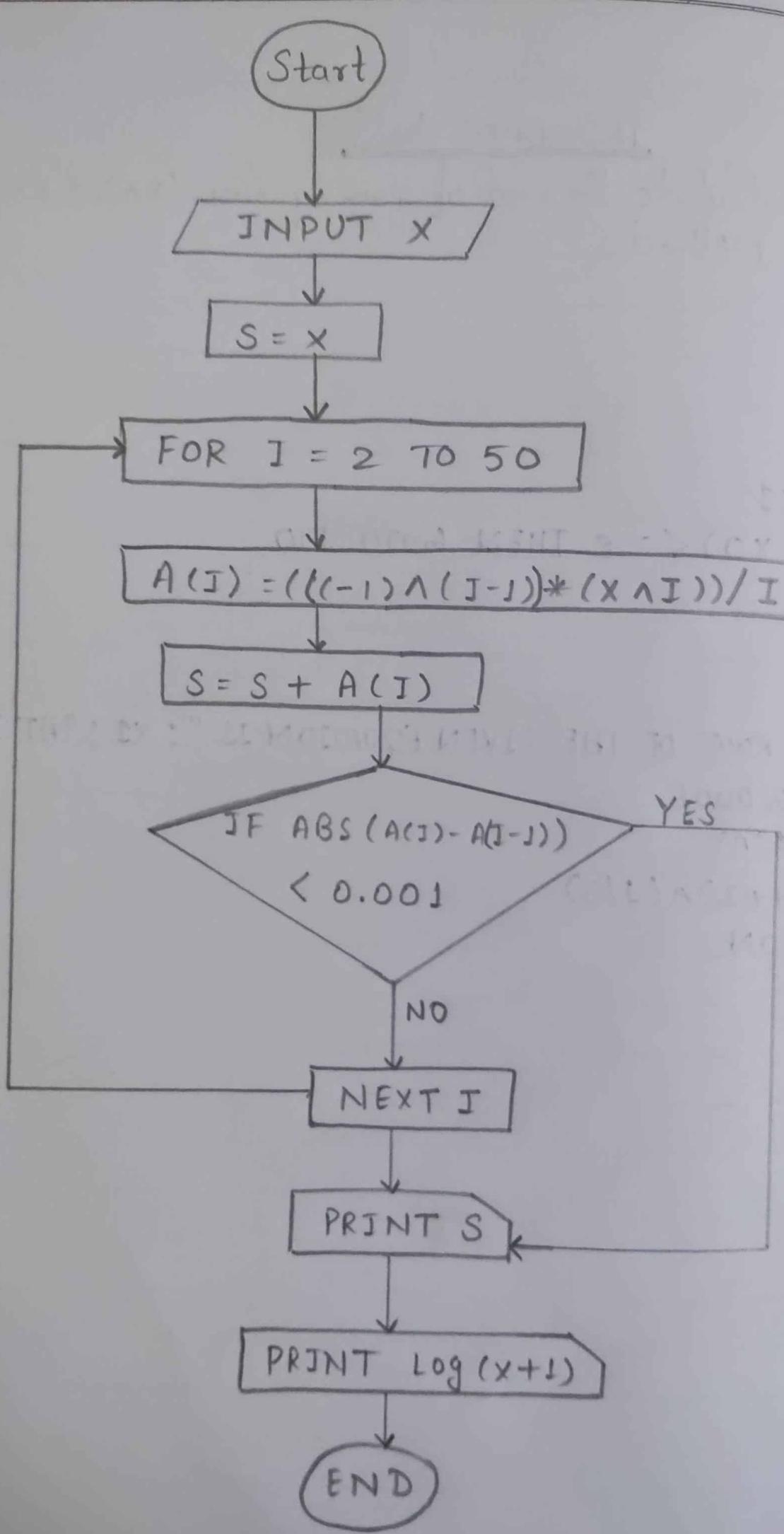
DEVRAJ RAWAT

2131231

Enter the value of X? 1

THE SUM OF THE SERIES = .693147 WHICH CONVERGE TO ACTUAL VALUE IN 51 TERMS

THE VALUE OF LOG(X+1) SERIES IS = .6931472



PROGRAM # 20

Program to find the root of given equation ($x^3 + (9x^2) - 1023 = 0$)
using Newton Raphson Method.

```

90 READ X0, e
100 J=1
120 FX = F0(X0)
130 DFX = DFO(X0)
135 XJ = X0 - (F0(X0) / DFO(X0))
136 PRINT J; XJ
140 IF ABS((XJ-X0)) < e THEN GOTO 160
145 X0 = XJ
148 J = J + 1
150 GO TO 135
160 PRINT "THE ROOT OF GIVEN EQUATION IS"; XJ; "AT ITERATION"; J
162 DATA J, 0.0001
165 END

FUNCTION F0(A)
  F0 = A^3 + (9A^2) - 1023
END FUNCTION

FUNCTION DFO(B)
  DFO = 3 * B^2 + (9 * 2 * B)
END FUNCTION

```

10 Cls

20 Rem To find the root of given equation ($X^3 + (913 \cdot X^2) - 1023$) Using Newton Raphson Method.
30 Print "Program no.20: To find the root of given equation ($X^3 + (913 \cdot X^2) - 1023$) Using Newton Raphson Method."

40 Print " _____ "

50 Print Date\$; "and"; Time\$

60 Print "DEVRAJ RAWAT"

70 Print "2131231"

80 Print " _____ "

90 Read XO, e

100 I = 1

120 FX = FO(XO)

130 DFX = DFO(XO)

135 XI = XO - (FO(XO) / DFO(XO))

136 Print I; XI

140 If Abs((XI - XO)) < e Then GoTo 160

145 XO = XI

148 I = I + 1

150 GoTo 135

160 Print "THE ROOT OF GIVEN EQUATION IS "; XI; "AT ITERATION "; I

162 Data 1,0.0001

165 End

Function FO (A)

$$FO = A^3 + (913 \cdot A^2) - 1023$$

End Function

Function DFO (B)

$$DFO = 3 \cdot B^2 + (913 \cdot 2 \cdot B)$$

End Function

Program no.20: To find the root of given equation ($X^3 + (913 \cdot X^2) - 1023$) Using Newton Raphson Method.

05-01-2024 and 10:33:29

DEVRAG RAWAT

2131231

1 1.059595

2 1.057917

3 1.057915

THE ROOT OF GIVEN EQUATION IS 1.057915 AT ITERATION 3

PROGRAM #22

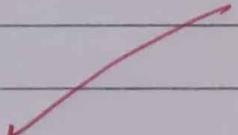
Program to evaluate the integral $I = (x^2 - 3x + 2) dx$ using the Trapezoidal rule.

```

100 READ a, b
110 INPUT "Enter the no. of even subintervals"; n
120 LET h = (a+b)/n
130 S = F(a) + F(b)
140 FOR i = 1 TO n
    150 S = S + F(a+i*h)
160 NEXT i
170 Integral = (h/2)* S
180 PRINT "The value of integral using Trapezoidal rule is"; Integral
190 DATA 5, 10
200 END

FUNCTION F(A)
    F = (A^2 - 3*A + 2)
END FUNCTION

```



10 Cls

20 Rem To evaluate the integral $I = (X^2 - 3X + 2) dX$ using the Trapezoidal rule

30 Print "Program no.22: To evaluate the integral $I = (X^2 - 3X + 2) dX$ using the Trapezoidal rule."

40 Print " _____ "

50 Print Date\$; "and"; Time\$

60 Print "DEVRAJ RAWAT"

70 Print "2131231"

80 Print " _____ "

100 Read a, b

110 Input "Enter the no. of even subintervals "; n

120 Let $h = (a + b) / n$

130 $S = F(a) + F(b)$

140 For i = 1 To n

150 $S = S + F(a + i * h)$

160 Next i

170 Integral = $(h / 2) * S$

180 Print "The value of integral using Trapezoidal rule is "; Integral

190 Data 5,10

200 End

Function F (A)

$F = (A ^ 2 - 3 * A + 2)$

End Function

Program no.22: To evaluate the integral $I = (X^2 - 3X + 2) dX$ using the Trapezoidal rule.

05-01-2024 and 11:34:23

DEVRAYA RAWAT

2131231

Enter the no. of even subintervals ? 100

The value of integral using Trapezoidal rule is 1064.953

PROGRAM # 24

Program to display the sum of sine series.

```

101 INPUT "enter the value of x : "; x
102 s = 0
103 xrad = (x * 3.14159265359) / 180
104 k = 1
105 tn = 0
110 FOR j = 1 TO 10
111   k = (2*j) - 1
112   GO SUB 170
113   f1 = f
114   tn = tn + 1
115   t = ((xrad ^ k) * ((-1) ^ (j+1))) / f1
116   s = s + t
117 IF (ABS(s - (sin(xrad))) < 0.0001) THEN GOTO 130
120 NEXT j
130 PRINT "number of terms = "; tn
140 PRINT "Calculated value = "; s
150 PRINT "actual value = "; (sin(xrad))
160 END
170 f = 1
180 FOR i = k TO 1 STEP -1
190   f = f * i
200 NEXT i
210 RETURN

```

10 Cls

20 Rem Program To to display the sum of sine series

30 Print " "

40 Print "Program :To to display the sum of sine series "

50 Print " "

60 Print

70 Print Date\$; " and "; Time\$

80 Print "DEVRAJ RAWAT"

90 Print "2131231"

95 Print " sin series : $\sin(x) = x - x^3/3! + x^5/5! - \dots$ "

100 Print

101 Input "enter the value of x : "; x

102 s = 0

103 xrad = (x * 3.14159265359) / 180

104 k = 1

105 tn = 0

110 For j = 1 To 10

111 k = (2 * j) - 1

112 GoSub 170

113 f1 = f

114 tn = tn + 1

115 t = ((xrad ^ k) * ((-1) ^ (j + 1))) / f1

116 s = s + t

117 If (Abs(s - (Sin(xrad))) < 0.001) Then GoTo 130

120 Next j

130 Print "number of terms ="; tn

140 Print "calculated value = "; s

150 Print "actual value = "; (Sin(xrad))

160 End

170 f = 1

180 For i = k To 1 Step -1

190 f = f * i

200 Next i

210 Return

New ✓

Program : To to display the sum of sine series

05-03-2024 and 00:37:43

DEVRAJ RAWAT

2131231

sin series : $\sin(x) = x - x^3/3! + x^5/5! - \dots$

enter the value of x : ? 1

number of terms = 1

calculated value = 1.745329E-02

actual value = 1.745241E-02

PROGRAM # 23

Program to evaluate the integral using simpson's rule

```

110 INPUT "enter the value of lower limit="; a
120 INPUT "enter the value of upper limit="; b
130 INPUT "enter the no. of even subintervals you want = "; n
140 x = (b-a)/n
150 S1 = 0
160 S2 = 0
170 S = f(a) + f(b)
180 FOR i = 1 TO (n-2) STEP 2
    190 S1 = S1 + f(a+(i*x))
    200 S2 = S2 + f(a+(i+1)*x)
203 NEXT i
204 S = S + (4*S1) + (2*S2)
210 S = S * (x/3)
220 PRINT "THE INTEGRAL OF GIVEN EQUATION IS = "; S
230 END
FUNCTION f(A)
    f=(A+3)^2
END FUNCTION

```

```
10 Cls
20 Rem Simpsons 1/3 rule.
30 Print "Program no.23: Simpsons 1/3 rule."
40 Print " "
50 Print
60 Print Date$; "and"; Time$
70 Print "DEVRAJ RAWAT"
80 Print "2131231"
90 Print " "
100 Print
110 Input " enter the value of lower limit.=", a
120 Input " enter the value of upper limit.=", b
130 Input "enter the no. of even subinterval you want=", n
140 x = (b - a) / n
150 s1 = 0
160 s2 = 0
170 s = f(a) + f(b)
180 For i = 1 To (n - 2) Step 2
190 s1 = s1 + f(a + (i * x))
200 s2 = s2 + f(a + (i + 1) * x)
203 Next i
204 s = s + (4 * s1) + (2 * s2)
210 s = s * (x / 3)
220 Print " THE INTEGRAL OF GIVEN EQUATION IS="; s
230 End
```

Function f (A)

$$f = (A + 3)^2$$

End Function

Program no.23: Simpsons 1/3 rule.

05-03-2024 10:49:28
DEVRAJ RAWAT
2131231

enter the value of lower limit.=5
enter the value of upper limit.=10
enter the no. of even subinterval you want=100
THE INTEGRAL OF GIVEN EQUATION IS= 550.4865

Expt. No. _____

PROGRAM # 26

Program to calculate the volume of van der waal gas by iteration method.

102 READ e

105 R = 0.0821

106 REM R in L atm/mol K

110 INPUT "Enter the value of n, T, P"; n, T, P

111 INPUT "Enter the value of a, b"; a, b

112 VO = (n * R * T) / P

115 I = 1

120 VI = F(VO, n, R, T, P, a, b)

123 PRINT I; VI

130 IF ABS(VI - VO) <= e THEN GOTO 170

140 LET VO = VI

150 I = I + 1

160 GOTO 120

170 PRINT "THE VOLUME OF THE OXYGEN GAS IS "; VI; "AT"; P;
"atm and "; T; "K at "; I; "ITERATION."

175 DATA 0.0001

180 END

FUNCTION F(s, m, q, o, p, c, d)

F = ((m * q * o) / (p + (c * m * m) / (s * s))) + (m * d)

END FUNCTION.

10 Cls

20 Rem Program To calculate the volume of vander waal gas by iteration method

30 Print " _____ "

40 Print "Program:To calculate the volume of vander waal gas by iteration method "

50 Print " _____ "

60 Print

70 Print Date\$; " and "; Time\$

80 Print "DEVRAJ RAWAT"

90 Print "2131231"

100 Print

102 Read e

105 R = 0.0821

106 Rem R in L atm / mol K

110 Input "Enter the value of n,T,P"; n, T, P

111 Input "Enter the value of a,b"; a, b

112 V0 = (n * R * T) / P

115 I = 1

120 VI = F(V0, n, R, T, P, a, b)

123 Print I; VI

130 If Abs(VI - V0) <= e Then GoTo 170

140 Let V0 = VI

150 I = I + 1

160 GoTo 120

170 Print "THE VOLUME OF THE OXYGEN GAS IS "; VI; " AT "; P; " atm and "; T; "K at "; I; "ITTERATION."

175 Data 0.0001

180 End

190 Function F (s, m, q, o, p, c, d)

200 F = ((m * q * o) / (p + (c * m * m) / (s * s))) + (m * d)

210 End Function

Program: To calculate the volume of vander waal gas by iteration method

05-03-2024 and 00:41:52

DEVRAJ RAWAT

2131231

Enter the value of n,T,P? 1,300,10

Enter the value of a,b? 1.59,0.0318

- 1 2.431893
- 2 2.430316
- 3 2.430235

THE VOLUME OF THE OXYGEN GAS IS 2.430235 AT 10 atm and 300 K at 3

PROGRAM # 27

Program to evaluate the change in the enthalpy of methane gas using Trapezoidal rule.

```

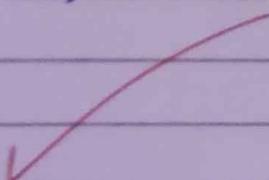
110 INPUT "enter the initial temp. = "; a
120 INPUT "enter the final temp. = "; b
130 INPUT "enter the no. of moles = "; n
140 X = (b-a)/n
170 S = f(a) + f(b)
J80 FOR i = 1 TO n STEP 1
190 S = S + f(a+i*x)
200 NEXT i
210 S = S * (x/2)
220 PRINT "THE change in the enthalpy is "; s
230 END

```

FUNCTION f(T)

$$f = -4.3 * (10^4 - 6) * (T^{12}) + 1.804 * (10^4 - 2) * T + 3.381$$

END FUNCTION



*Dudeek
3/15/2014*

10 Cls

20 Rem To evaluate the change in the enthalapy of methane gas.

30 Print "Program : To evaluate the change in the enthalapy of methane gas ."

40 Print " _____ "

50 Print

60 Print Date\$; "and"; Time\$

70 Print "DEVRAJ RAWAT"

80 Print "2131231"

90 Print " _____ "

100 Print

110 Input " enter the initial temp.=", a

120 Input " enter the final temp.=", b

130 Input "enter the no. of mole=", n

140 x = (b - a) / n

170 s = f(a) + f(b)

180 For i = 1 To n Step 1

190 s = s + f(a + i * x)

200 Next i

210 s = s * (x / 2)

220 Print " THE change in the enthalapy is"; s

230 End

Function f (T)

f = -4.3 * (10 ^ -6) * (T ^ 2) + 1.804 * (10 ^ -2) * T + 3.381

Untitled
Program : To evaluate the change in the enthalapy of methane gas .
05-03-2024 and 00:46:08
DEURAJ RAJAT
2131231

enter the initial temp.=200
enter the final temp.=600
enter the no. of mole=1
THE change in the enthalapy is 6426.199