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036/2

COMPUTER STUDIES 2- PRACTICAL
(For Both School and Private Candidates)

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Time: 3 Hours
Instructions.
1. This paper Consists of 3 (Three) question
2. Answer only One question
3. Write all the answers in the answer booklet provided
4. Show all the steps in your working, giving answers at each stage
5. Write your Examination Number on every page of your answer

1. A sum of money P, has been invested for N years at compound interest at the rate of R% per annum.

The final amount A of money is represented by

\[ A = P\left(1 + \frac{R}{100}\right)^N \]

We would like to write a computer program, which when supplied with values of P, R, N will print the value of A.

(a) Draw a flowchart diagram to represent the design of this program.

(b) Using BASIC language write a program which reads the values of P, R and N and prints the value of A in the follows format.

THE AMOUNT OF MONEY IS XX

2. Write a Basic program to read numbers in the range 40-80 and print the corresponding grade letters where
   A represents values from 70 to 80
   B represents values from 60 to 69
   C represents values from 50 to 59
   D. represents values from 40 to 49

   An error “OUT OF RANGE” should be displayed if a number below 40 or above 80 is entered. Use a dummy value of O to stop the program. The output should look like this

   MARK            GRADE
   XX                     XX

3. Write a Basic program to display the following identity matrix.

\[ I = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \]
SOLUTIONS SCHEME

ANSWER NO 1
1. Problem definition: To find the value of money invested at the rate of R% for N years.
   Output: Final Amount
   Input: Money (P), rate, years
   Process: To calculate Find Amount
   \( A = P \left(1 + \frac{R}{100}\right)^N \)

2. Algorithm
   Start
   Enter money, rate, and years
   Calculate Amount (final Amount)
   Display Final Amount
   END

3. Flow chart

4. The program
   5 Cls
   10 REM PROGRAM TO CALCULATE FINAL AMOUNT
   20 READ p, r, n
   30 a = p * \((1 + \frac{r}{100})^n\)
   40 DATA 1000,3,1
   50 Print “THE AMOUNT OF MONEY IS “; a
   60 END

ANSWER NO 2:
1. Problems Definition: Read a number and prints its grade letter.
   Output: Number, grade
   Input: numbers in a range 40-80
   Process: Reading a number and checking if a number represents values from 70 to 80 then grade A
   if values are from 60 to 69 then grade B
   if values are from 50 to 59 then grade C
   if values are from 40 to 49 then grade D

2. Algorithm
   Start
   Input a number
   Checking if its grade A, B, C or D
   Display a number and grade
   END.

3. The program
   10 REM ENTER NUMBER AND PRINT CORRESPONDING GRADE LETTER
   20 INPUT “ENTER A NUMBER”; n
   25 IF n <>0 then 30 else go to 90
   30 IF n < 40 or n > 80 then Print “OUT OF RANGE”: GO TO 20
   40 IF n >= 70 then g$ = “A” : go to 80
   50 IF n >= 60 then g$ = “B”: go to 80
   60 IF n >= 50 then g$ = “C” : go to 80
   70 IF n >= 40 then g$ = “D”: go to 80
   80 Print “Mark”, “Grade”
   85 Print n,g$
   90 END

ANSWER 3
1. Problem definition. To write a program to create a 2 x 2 identity matrix and printing it.
   Output: identity matrix
   Input: 1,0,0 1
   Process: Create a 2x2 table using subscripted variables and print the table (Matrix)

2. Algorithm
   Start
   read values
   Create a matrix
   Display the matrix
   END

3. Program
   10 DIM A(2,2)
   20 for i = 1 to 2
   30 For j = 1 to 2
   30 Read A(i,j)
   40 Next j
   50 Next i
   60 Data 1,0,0,1
   70 For i = 1 to 2
   80 For j = 1 to 2
   90 print A(i,j);)
   100 Next j
   110 Print
   120 Next i
   130 END