Q1: Write a program to calculate and print even numbers between 10 and 99

Solution:

I=10
10 PRINT I
I=I+2
IF I<=98 THEN GOTO 10

Q2: Write a program to determine a student’s final grade and indicate whether it is passing or failing. The final grade is calculated as the average of four marks.

Solution:

Input M1,M2,M3,M4
GRADE = (M1+M2+M3+M4)/4
IF (GRADE < 50) THEN
    Print “FAIL”
ELSE
    PRINT “PASS”
END IF

Q3: Create programs using FOR/NEXT loops to do each of the following.

1. Print your own name ten times of separate lines.
2. Print the even numbers between 21 and 71 on one line.
3. Print a conversion table from gallons to litres starting at one gallon and finishing with 20 gallons. (1 gallon = 4.5 litres).
4. Count backwards from 20 to 1 and have the numbers all appear on the same line.
5. Read 10 numbers from a DATA statement and calculate their average.
6. Sum the first 100 numbers and print out:
   THE SUM OF THE FIRST 100 NUMBERS IS <ANSWER>

Q4: Write an algorithm to convert the length in feet to centimeter.

**Algorithm**

START
Input Length_in_ft
Length_in_cm = Length_in_ft x 30
Print Length_in_cm
END
Q5: Write a program to sort ten numbers?

Solution:

```qbasic
DIM nums(10)
CLS
FOR i = 0 TO 9
    nums(i) = (RND * 10) + 1
    PRINT nums(i)
NEXT
PRINT
PRINT "Press Enter to sort numbers"
REM pause to look at numbers
FOR W=1 TO 100
NEXT W
CLS
FOR loop1 = 0 TO 9
    FOR loop2 = loop1 + 1 TO 9
        IF nums(loop1) > nums(loop2) THEN SWAP nums(loop1), nums(loop2)
    NEXT
NEXT
FOR i = 0 TO 9
    PRINT nums(i)
NEXT
```

Q6: Write a simple but a complete Qbasic that will accept three numbers find the sum and the average of these numbers?

Solution:

```qbasic
CLS
PRINT "Maths PROGRAM: Calculates both sum total/and, average of 3 numbers"
PRINT
PRINT "You will be required to enter 3 numbers, separately; one at a time;"
PRINT "then, the program will find the 3 numbers sum total/and, also, average."
PRINT
INPUT "Enter number 1"; number1%
INPUT "Enter number 2"; number2%
INPUT "Enter number 3"; number3%
total% = number1% + number2% + number3%
average% = total%/3
PRINT "The total of your 3 numbers is: "; total%
PRINT "The average of your three numbers is: ";average%
END
```
Q7: How do you create a calculator on QBASIC?

Solution: Using SELECT/CASE

CLS
PRINT "Welcome to the QBASIC Calculator!"
PRINT "Enter two numbers each separated by a comma: (n,n)"
INPUT num1, num2
PRINT "Choose a basic operation:"
PRINT "MENU: 1> Add 2> Subtract 3> Multiply 4> Divide"
INPUT "Type a menu selection number from 1 to 4"; opNo%
SELECT CASE opNo%
CASE 1: answer = num1 + num2
CASE 2: answer = num1 - num2
CASE 3: answer = num1 * num2
CASE 4: answer = num1 / num2
END SELECT
PRINT "The answer is: "; answer
END

Solution: Using IF/THEN

10 CLS
20 PRINT "Welcome to the QBASIC Calculator!"
30 PRINT "Enter two numbers."
40 INPUT nm, nm1
50 PRINT "Choose a basic operation:"
70 INPUT num
80 IF num = 1 THEN 100
90 IF num = 2 THEN 110
91 IF num = 3 THEN 120
92 IF num = 4 THEN 130
100 PRINT "The result is"; nm + nm1
GOTO 140
110 PRINT "The result is"; nm - nm1
GOTO 140
120 PRINT "The result is"; nm * nm1
GOTO 140
130 PRINT "The result is"; nm / nm1
140 END
Q8:

The perimeter \( P \) and the AREA of a triangle whose sides have lengths \( a, b, c \) are given \( P = a + b + c \) and \( \text{AREA} = \sqrt{s(s-a)(s-b)(s-c)} \) where \( s = \frac{a+b+c}{2} \). Write a pseudocode program with input \( a, b, c \) and output \( P \) and \( \text{AREA} \)

Solution:

```plaintext
INPUT A,B,C
P=A+B+C
S=P/2
AREA=SQR(S*(S-A)*(S-B)*(S-C))
PRINT P
PRINT AREA
END
```

Q9: Execute the following programs:

1. CLS
   REM Input statements
   INPUT "Enter a number: "; num
   square = num ^ 2
   PRINT num; "squared= "; square
   END

2. INPUT "Enter the first of 3 numbers: "; first
   INPUT "Enter the 2nd of 3 numbers: "; second
   INPUT "Enter the 3rd of 3 numbers: "; third
   sum = first + second + third
   PRINT "The sum is "; sum
   END

3. INPUT "Enter the first of 3 marks: "; mark1
   INPUT "Enter the second of 3 marks: "; mark2
   INPUT "Enter the third of 3 marks: "; mark3
   PRINT
   avg = (mark1 + mark2 + mark3) / 3
   PRINT "The average for the 3 marks is: "; avg
   END
4.  
INPUT "Goals scored:"; goalz
INPUT "Behinds scored:"; bhind
score = 6 * goalz + bhind
PRINT "That gives a score of "; score; "points"
END

5.  
REM Wage Calculation
INPUT "Employee Name:"; name$
INPUT "Hours worked: "; hours
INPUT "Hourly rate: "; rate
wage = hours * rate
PRINT "The wage for "; name$; " is "; wage
END

Q10: Write algorithms and programs that will result in the following outputs. Make use of the INPUT statement.
1. Enter your name
   Date of Birth
   Class
   Output Screen should look like:
   Name     Birth date     Class
   Baron    21/08/00       1 Production&Meta

2. Enter the first of four numbers:
   Enter the second of four numbers:
   Enter the third of three numbers:
   Enter the fourth of four numbers:
   The sum of the numbers is:
   The Average of the numbers is:

Q11: Develop a program to calculate the Volume of a Cylinder by using the formula:
V=\pi r^2 h \quad \pi = 3.141593

Q12: Write a program to calculate the floor space (area) of a classroom, by first asking the for the length and width of the classroom.
Q13: Write a Program to classify materials as very light, light, medium, heavy.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al</td>
<td>2.699</td>
</tr>
<tr>
<td>Cr</td>
<td>7.19</td>
</tr>
<tr>
<td>Ti</td>
<td>4.5</td>
</tr>
<tr>
<td>Li</td>
<td>0.534</td>
</tr>
<tr>
<td>Ni</td>
<td>8.9</td>
</tr>
<tr>
<td>Cu</td>
<td>8.93</td>
</tr>
<tr>
<td>Fe</td>
<td>7.87</td>
</tr>
</tbody>
</table>

**Solution**

```vbnet
Dimension a$(8), d(8)
FOR i = 1 TO 8
    Read a$, d
    IF d < 2.5 THEN
        PRINT a$; " is a Very Light Metal"
    ELSEIF d > 2.5 AND d < 3.5 THEN
        PRINT a$; " is Light Material"
    ELSEIF d > 3.5 AND d < 5.2 THEN
        PRINT a$; " is Medium Metals"
    ELSE
        PRINT a$; " is Heavy Metal"
    END IF
NEXT i
Data al,2.699,cr ,7.19, ti,4.5, li,0.534,ni,8.9,cu,8.93fe,7.87
END```

Q14: Applied example:

- Open the QBASIC editor and activate the Immediate window.
- Type the following statements one at a time, pressing Enter after each one:

```vbnet
a = 5
PRINT a
b = 12
c = a * b
PRINT c
first$ = "Fred"
PRINT first$
second$ = "Flintstone"
full$ = first$ + " " + second$
PRINT full$
first$ = "Wilma"
PRINT full$
a = 7
PRINT a
a = a + 2
PRINT a
myAge = 23
myHouse$ = "23"
PRINT myAge, myHouse$
```