CHAPTER - 6

Introduction to QBasic

Every simple operation to complex mathematical calculations is performed by computers very easily. It happens only because computer follows a set of pre-defined instructions. This set of instruction is called a program.

BASIC

BASIC is a programming language for beginners. It stands for **Beginner's All Purpose Symbolic Instruction Code**. BASIC was designed in 1964 by **John George Kemeny** and **Thomas Eugene Kurtz**. It is an easy and simple programming language to understand. **GW BASIC, Quick BASIC and QBASIC** are the popular versions of BASIC.

QBasic

QBasic is a high level programming language created by Microsoft. It is based upon the original language BASIC.

It is very easy to learn and can be used to create utilities, games, demos etc.

It can help you develop your programming skills and enable you to learn other languages such as C, Visual Basic and many others quickly.

Elements of QBasic

Let us learn about the elements that constitute a program in QBASIC.

Character Set

Character sets are all those characters which are used to write a program in QBasic. The character set includes:

Alphabets: A to Z or a to z

Numerals: 0 to 9

Special characters: + - /,; $ #! ? & | etc.

Keywords or Reserved Words

QBasic have a pre-defined words called keywords or reserved words. They have specific meaning in the program. A few QBasic keywords are:

REM LET INPUT NOT OR AND PRINT END

Constants

Constants are identities in a QBasic that do not change while executing the program. QBasic deals with 2 type constants:

Numeric constant: It refers to numbers. Example, 56, -89, 45 etc.

String/Alphanumeric constant: The string constants refer to valid set of characters enclosed within quotes. Example, "Name", "India" etc.

Variables

Variables are names given to a memory location where data is stored. Variables may be broadly classified as:

Numeric Variable: It stores only numbers. Arithmetic operations can be performed on them. For example, A=9

Alphanumeric/String Variable: It stores any one character or a group of characters. Arithmetic operations cannot be used on them. These variables are generally suffixed with the $ (dollar) symbol to differentiate itself from numeric variables. For example, LET A$="India"

Rules for Writing Variables

1. A variable can be single letter or more than one letter but not more than 40 or can be digits but should always begin with a letter. Thus B, A1, A2 are completely valid variables but 2A is invalid.
2. There should not be any space in between the variable name. For example, BIGNAME is a valid variable but BIG NAME isn't.
3. No punctuators or operators can be used with a variable. For example, A+B is not a valid variable.
4. Reserved words cannot be used as the name of a variable.

QBasic Operators

Operators are special symbols which generate a new value from one or more given values. Operators are of following types:

Assignment Operator

The symbol of assignment operator is =. The left hand side is always a variable. The operator takes a copy of the value on the RHS and stores it in the variable on the LHS.

Example of Assignment Operator	Meaning
A=7	Stores 7 in the variable A
ABC= PQR	Stores

Arithmetic Operators

These operators work on numeric type data (constant or variable) and give a numeric type value.

Arithmetic Operator	Symbol	Example
Addition	+	3+2 will give result to 5
Subtraction	-	8-4 will give result to 4
Multiplication	*	4*3 will give result to 12
Division	/	25/5 will give result to 5
Exponent	^	2^5 will give result to 32
Modulation	MOD	12 MOD 7 would result in 5

Operands are the quantities upon which the operators perform a calculation. For example the expression 7+6 indicates 7 and 6 are operands and + is the operator.

Hierarchy of Operators

Hierarchy means the order of calculation. Whenever you have a mathematical expression having more than one operator it is necessary to understand which operator will be evaluated first. The list below shows the order of calculation of arithmetic operators.

1. () brackets have the maximum priority and will be evaluated first.
2. ^ gets the next priority.
3. / Or * whichever comes first from left to right gets evaluated next.
4. MOD gets the next priority.
5. + Or – whichever comes first from left to right gets evaluated lastly.

Thus, 4 + (6-2)* 3 will result in 16.

Relational Operators

Relational operators are used for comparison. They are used to compare two quantities and give a logical value true (-1) or false (0).

Relational Operator	Symbol	Example
Equal	=	8=8 it gives result true or -1
Less than	<	3<9 it gives result true or -1
Less than or equal to	<=	6<=6 it gives result true or -1
Greater than	>	8>4 it gives result true or -1
Greater than or equal to	>=	9>=9 it gives result true or -1
Not equal to	<>	9 < > 9 it gives result false or 0

Logical Operators

These operators are used to combine two or more relational expressions.

Logical Operator	Example	Result
NOT	NOT (A>3)	True if (A>3) is false and vice- versa.
OR	(A>3)OR (B=8)	True if either or both (A>3) and (B=8) is true.
AND	(A>3) AND (B=8)	True if both (A>3) and (B=8) are true.

QBasic Statements

A QBasic statement is a line of executable code. A statement tells the computer to carry out one action. The grammatical rule that a statement must follow is called the **syntax of the statement**. A statement violating the syntax will give an error when executed. Statements can be entered in any order but the execution will be in ascending order of statement numbers. Statements cannot be used as variable names.

LET Statement

It is an assignment statement and its function is to assign a value to a variable. The variable name is written to the right of the LET statement, followed by an equal to '=' sign and then the value.

Syntax: LET variable name = Constant or variable or expression

Example: LET N ="computer"

Variable N will store the string 'computer'

LET A2= 30

Number 30 will be stored in the variable A2

PRINT Statement

This statement is used to display the output on the screen. The computer executes a PRINT statement working from left to right. It displays numeric value, expressions, variables and messages. The PRINT statement separates items by using commas and semicolons. It prints exactly what is given within quotes.

Syntax: PRINT variable or constant or expression

Example: PRINT X

The value stored in variable X will be printed on the screen.

PRINT "X"

Character X will be printed on the screen.

PRINT 4+2

6 will be printed on the screen

INPUT Statement

The INPUT statement is a variation on the LET statement. In a LET statement, the value given to a variable is fixed and you cannot change the value of the variable in that particular program. The INPUT statement gives a choice to the user to enter any value making the program interactive. The INPUT statement is used to accept values from the user into variables and use these values for evaluation in a program. The variables in an INPUT statement are separated by commas.

Syntax: INPUT "Message'; variable variable

Example: INPUT "Enter name and age"; N, Age

OR

INPUT a, b, c

END Statement

Every program must have an END statement which is written as the last statement in a program. END marks the end of the program. There should be only one END statement given in a program as it signifies the termination of a program.

Syntax: END

STOP Statement

Although this may appear to be identical to the END statement, the STOP statement makes the computer halt the execution of a process at that particular point, where it has been encountered. There can be more than one STOP statement in a single program.

Syntax : STOP

REM Statement

The REM statement is used to give remarks to a program. It is like a program heading. It does not take part in the execution of a program and just give better documentation of a program.

Syntax: REM message

Example: REM **this is a program to add two numbers**

CLS Statement

This statement is used to clear the screen.

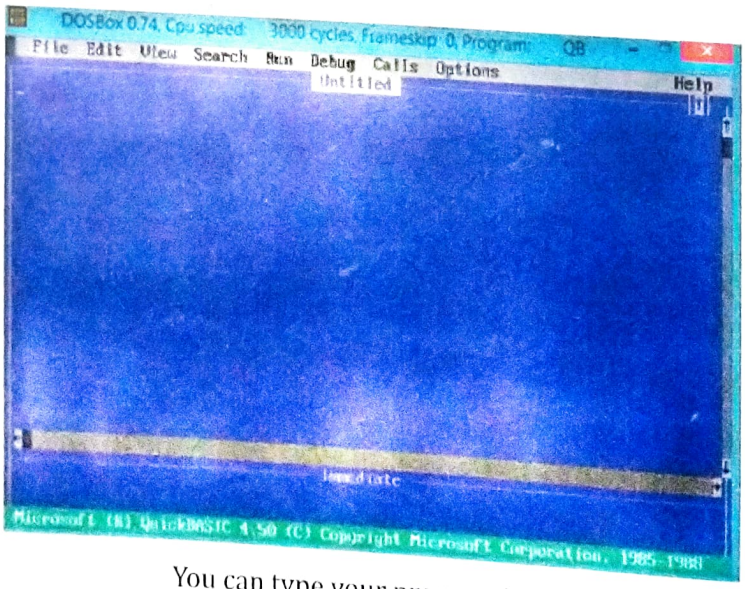
Syntax: CLS

Starting QBasic

To write QBasic program you need to download 'QBASIC.EXE'. You can download it from the internet. QBASIC.EXE, however, will not run on Windows 7.

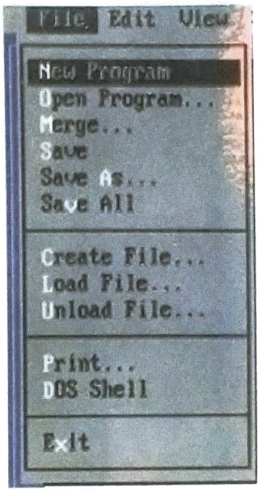
(See appendix at the end of the book to learn how to run QBASIC.EXE on Windows 7.)

You will get the following QBASIC window.



You can type your program here.

Save a Program



1. Click on File menu and select Save. The Save dialog box opens.

   OR

   Press Alt + F to select File menu and then press S.

2. Give a name to your program in the file name box and press Enter.

The file will be saved with extension .BAS. Make sure that file should not have more than 8 characters.

Open and Exit QBasic

1. To open a QBasic program click Open from File menu.

   OR

   Press Alt + F to select File menu and then press O.

2. Select the program from the list and press Enter

To exit a QBasic window, click on Exit from File menu.

Run a Program

You can run a program in many ways to see the output:

- By pressing F5.
- By typing RUN in the immediate mode and pressing Enter.
- By clicking Start from Run menu.

How to Write a Program in QBasic?

Let us write a very simple QBasic Program.

To start with a new program click on File menu and click on New option. You get a blank screen where you can type your first program. The space where you type your program is called the **Editor window**.

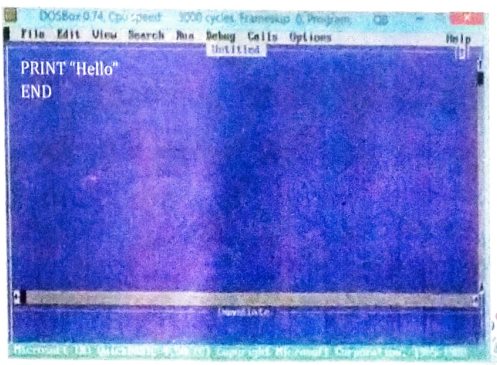
1. Write a program to print "Hello"

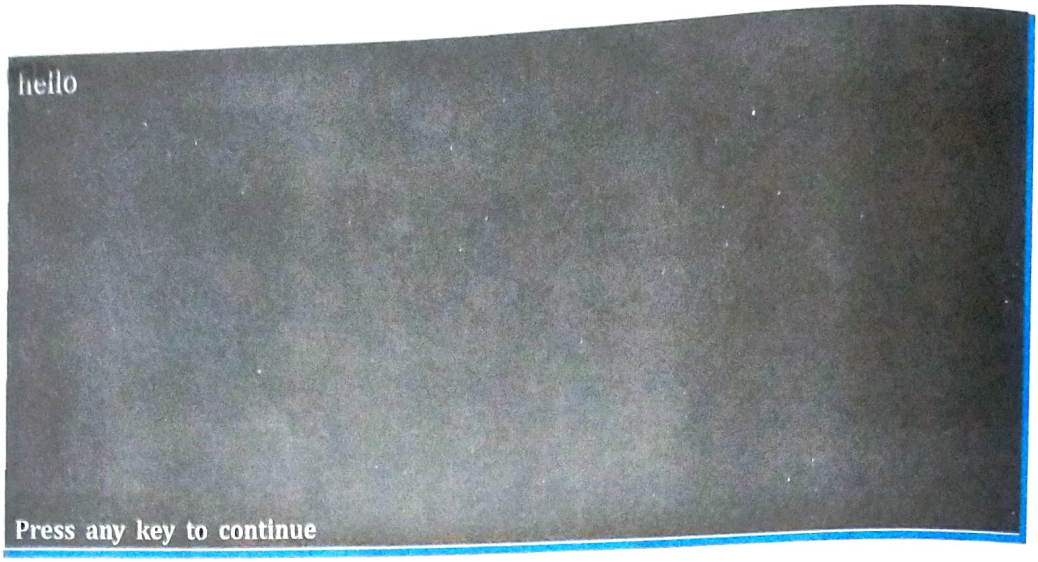
In the blank screen type the following:

```
PRINT "Hello"
END
```

To run this program press the F5 key

For the program above you will get the output as

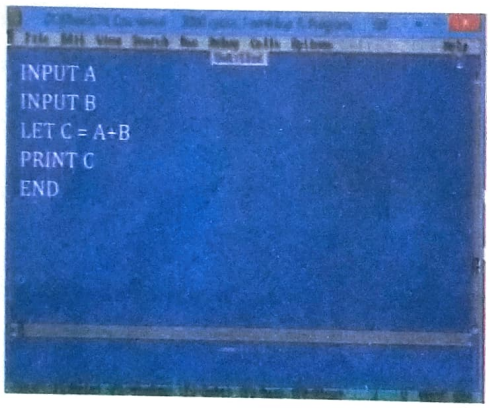


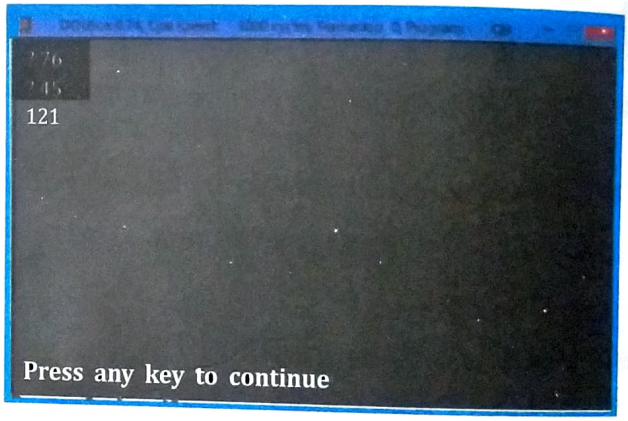


Then press any key to continue will bring back the **QBasic Editor**.

2. **Write a program to input two numbers from keyboard and print their sum.**

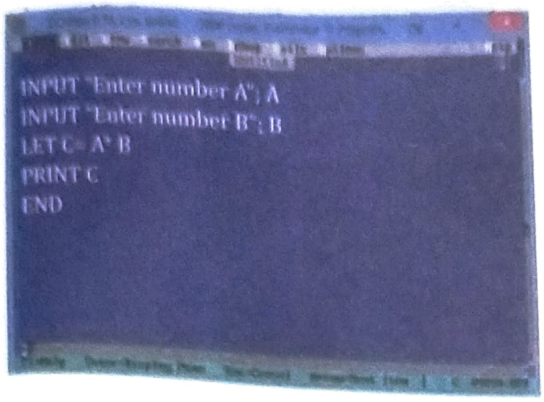
```
INPUT A
INPUT B
LET C = A+B
PRINT C
END
```

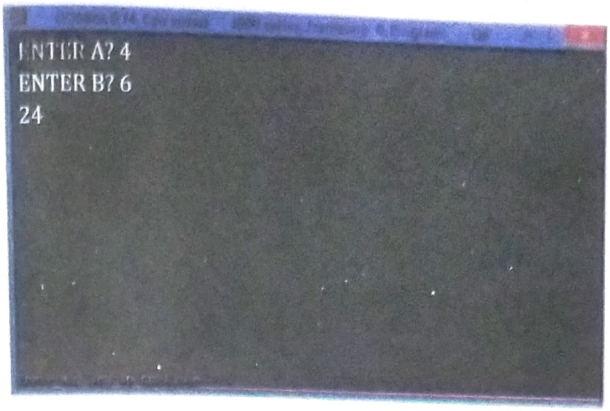




3. **Write a program to input two numbers and print their product.**

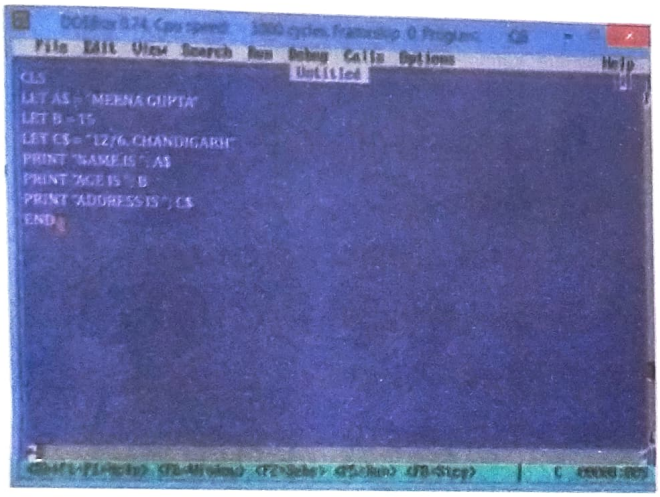
```
INPUT "Enter number A"; A
INPUT "Enter number B"; B
LET C= A* B
PRINT C
END
```

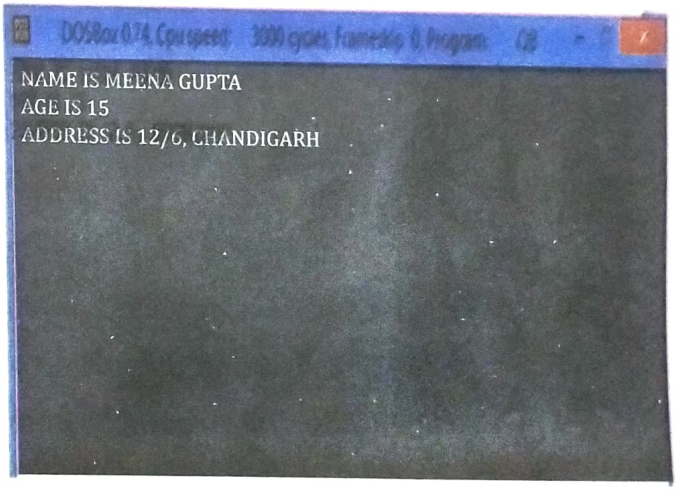




4. Write a program to print your name, age and address.

```
LET A$ = "MEENA GUPTA"
LET B = 15
LET C$ = "12/6, CHANDIGARH"
PRINT "NAME IS "; A$
PRINT "AGE IS "; B
PRINT "ADDRESS IS "; C$
END
```

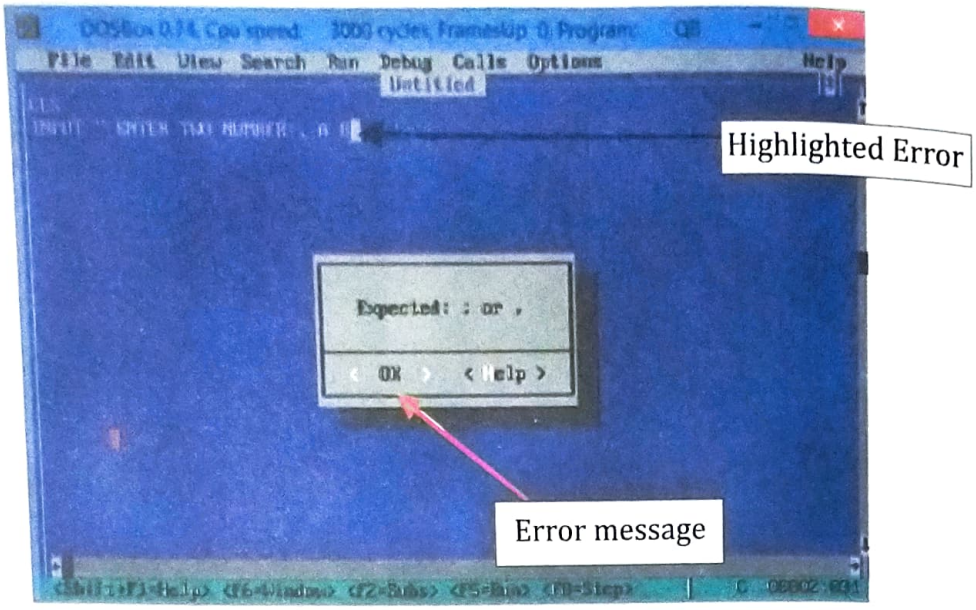




Bugs

While programming, there might be situations when your program may not run correctly. This might happen because of errors in the program. Error in a program is called bug. Whenever you get a bug in your program you start with the process of removal of such bugs. The process of removal of bug is called **debugging**.

In QBasic, it highlights the position where the error has occurred and shows you what error has occurred.



Quick Review

- QBASIC stands for Quick Beginners All Purpose Symbolic Instruction Code.
- .BAS is an extension of a QBasic file.
- The character set of QBasic consists of alphabets, numerals and special characters.
- Keyword is a specific command used for programming.
- Variable is a name assigned to a memory location.
- Constant is a number having a fixed value throughout the program.
- LET is an assignment statement used to assign a value to a variable.
- PRINT is a command to display results on the screen.
- INPUT is a statement to enter a value from keyboard.
- END is a statement that terminates a QBasic program.
- STOP is a statement that halts the execution of a program at the particular point where it is given.
- REM is a statement to write remarks in a program.
- CLS is used to clear the screen.
- Operators are symbols or commands that are used to evaluate an expression.

- Arithmetic operators are used to evaluate a mathematical expression.
- Relational operators are used for comparison of two quantities.
- Logical operators are used to join two or more relations.
- Bugs are errors that occur during the execution of a program and the process of removing is called Debugging.

ASSESSMENT

1. Answer the following questions:

a. Differentiate between constants and variable.

b. State the rules you should follow while using variable names.

c. Give the hierarchy of the arithmetic operators.

d. Explain the difference between LET statement and INPUT statement with the help of an example.

e. What are logical operators used for? Name the different types of logical operators and their meaning.

f. State the difference between Numeric and Alphanumeric variable.

g. What are the QBasic operators?

2. Fill in the blanks:

a. CLS command is used to clear the screen.

b. Logical operators are used to join two or more relations.

c. PRINT statement is used to display items on the screen.

d. BASIC stands for Beginner's All purpose Symbolic Instruction Code.

e. A set of instructions is called a program.

f. The process of removing bugs is called Debugging

3. Write 'Yes' or 'No':

a. Bugs are errors in programs. Yes

b. The INPUT statement is used to display the output on the screen.

c. <> symbol is used to check the greater value of a variable.

d. The shortcut key for opening file menu is Alt + F.

e. The extension of a QBasic program file is .cpp.

f. Alphanumeric variables ends with * symbol.

NO
No
Yes
No
No

4. Give one word for the following:

a. The command that is used to terminate a program.

b. The extension of a program file in QBasic.

c. The command that is used to accept values from the user.

d. The shortcut command for executing the QBasic program.

e. The statement that halts the execution of a program.

END
.BAS
INPUT
F5
STOP

5. Give the output of the following programs:

a. PRINT "Amit"

PRINT " Rahul"

END

b. LET A = 5

LET B= 6

LET C= A*B – 2^ 5

PRINT C

END

c. LET A= 17

LET B = 3

LET C = A/B

LET D = A MOD B

PRINT C

PRINT D

END

d.
```
PRINT "India"
PRINT "Is"
PRINT "my"
PRINT "country"
END
```

LAB ACTIVITY

Write the QBasic programs for the following:

a. Write a program to calculate product of three numbers.

b. Write a program to calculate the area of rectangle.

c. Write a program to print your name, roll number and marks in four subjects.

d. Write a program to input the name of your 3 friends and print it.

Class- 6

Chapter - 6

1.) Answer the following questions:—

a.) Differentiate between constants and variable.

⇒

constants	Variable
Constants are identities in a QBASIC that do not change while executing the program.	Variable are names given to a memory location where data is stored.

b.) State the rules you should follow while using variable names.

⇒ Rules for writing Variables :—

1.) A Variable can be single letter or more than one letter but not more than 40. or can be

digits but should always begin with a letter.

2) There should not be any space in between the variable name.

3) No punctuators or operators can be used with a variable.

4) Reserved words cannot be used as the name of a variable.

C) Give the hierarchy of the arithmetic operators.

⇒ Hierarchy means the order of calculation.

1) [] brackets have the maximum priority and will be evaluated first.

2) ^ gets the next priority.

3) / or * whichever comes first from left to right gets evaluated next.

4) MOD gets the next priority.

5) + or - whichever comes first from left to right gets evaluated lastly.

d) Explain the difference between LET statement and input statement with the help of an example.

⇒

LET statement	INPUT statement
It is an ~~assignment~~ assignment statement and its function is to assign a value to a variable.	The INPUT statement is a variation on the LET statement. ~~In a LET state.~~
Example:- LET N = "computer"	Example:- INPUT "~~Me~~ Enter name and age"; N, Age

e) What are logical operators used for? Name the different types of logical operators and their meaning.

⇒ Operators are used to combine two or more relational

expressions.

Logical operator	Example	Result
NOT	NOT [A>3]	True if [A>3] is false and vice-versa.
OR	[A>3] OR [B=8]	True if either or both [A>3] and [B=8] is true.
AND	[A>3] AND [B=8]	True if both [A>3] and [B=8] are true.

f) State the difference between Numeric and Alphanumeric Variable.

⇒

Numeric	Alphanumeric
It stores any one character or a group of	

Numeric	Alphanumeric
It stores only numbers. Arithmetic operations can be performed on them. Example :- A=9	It stores any one character or a group of characters. Example :- LET A$= "India"

(7.) What are the QBasic operators?

⇒ operators are special symbols which generate a new value from one or more given values. QBasic operators are :- Assignment operator, Arithmetic operator, Hierarchy Relational operator, Logical operator.

5.) Give the output of the following program.

a. PRINT "Amit"
PRINT "Rahul"
END

⇒ Amit
Rahul

b. LET A = 5
LET B = 6
LET C = A * B - 2 ^ 5
PRINT C
END.

⇒ 5 * 6 - 2 ^ 5
-2

c. LET A = 17
LET B = 3
LET C = A / B
LET D = A MOD B
PRINT C
PRINT D
END

⇒ 17/3

5.6666667

17 MOD 3

2

d. PRINT "India"
PRINT "IS"
PRINT "My"
PRINT "country"
END

⇒ India ~~is~~.
IS
My
country
.