Ch 3 Control Structure

Q.1 What is control structure? Discuss different types of control structure

Control Structure:-

Control structures control the flow of execution of a program. There are three types of control structures in BASIC.--

1-Sequence Structure.
2-Selection Structure.
3- Loop Structure.

1-Sequence Structure.

In sequence structure instructions are executed according to the increasing order of their line numbers. The instructions at smaller line numbers are always executed first, then instructions at greater line numbers.

2-Selection Structure.

A selection structure chooses which alternative program statement(s) to execute. In GW-BASIC, We have IF...THEN, and IF...THEN...ELSE statements to implement selection structure.

3- Loop Structure.

A set of statements which are executed again and again up to fixed number of times or until a certain condition is fulfilled is called loop. For...Next and While ...Wend loops are used in Basic.

Q.2 What is meant by transfer of control? Discuss types of control transfer.

In GW-BASIC, during the execution of a program the program control can be transferred from one part of the program to another conditionally or unconditionally. GW-BASIC provides statements for both types of transfer of control.

Unconditional transfer of control:-

In unconditional transfer of control the program control switches to a specific line by skipping one or more lines without any condition.

Conditional transfer of control:-

In Conditional transfer of control the program control switches to a specific line number by skipping one or more program lines depending on a certain condition.

Q.3 Write down purpose and syntax of GOTO statement.

GOTO statement:--

GOTO statement is used to unconditionally transfer control from program line to a specified line out of the normal program sequence.

Syntax: Line# GOTO line number

Q.4 Write down purpose and syntax of ON GOTO statement.

ON GOTO statement:-

It is a multiple branches statement. GOTO statement allows only one transfer point. The ON GOTO statement can have more than one transfer points, thus providing multiple branching facility.

Syntax:

ON numeric variable or expression GOTO n1, n2, n3 . .

Q.5 Write down purpose and syntax of ON GOTO statement.

ON ERROR GOTO Statement:-

This command enables error trapping feature of GW-BASIC and specify the first line of error handling routine.

Syntax:

ON ERROR GOTO line number

Q.6 What is meant by ERR and ERL?

In GW-BASIC, each possible error has been assigned a unique code. When an error occurs its code is assigned to a special variable, named ERR and the line number where the error was encountered is assigned to another special variable, named ERL. The ERR and ERL are reserved words

Q.7 Which statements are used for return from error handling routine?

We can exit from an error handling routine using the RESUME, RESUME NEXT, RESUME line number or END statement.

- The RESUME statement returns the execution to the statement that caused the error and tries to execute it again.
- RESUME NEXT resumes the execution from the statement immediately following the statement that caused error.
- RESUME line number resumes the execution at the specified line number.

Q.8 Discuss IF THEN statement.

The IF THEN Statement:-

The IF THEN is a decision making statement, depending upon the decision, it can change the order of program execution. It is used to select a The IF THEN is a decision making statement, depending upon the decision, it can change the order of program execution. It is used to select a patch flow in a program based on a condition. A condition is an expression that either evaluates to true or false.

Syntax:

- IF expression THEN statement
- IF expression THEN line number

Q.9 Discuss IF THEN ELSE statement.

The IF THEN ELSE Statement:-

The IF THEN ELSE statement is a decision making statement as it decides the path of the program. It helps in making comparisons and testing whether a condition is true or not. The keyword ELSE is used to specify two different alternative with IF statement. Based on a condition, one of the two alternatives is executed.

Syntax:

IF (expression) THEN
Statement (true task)
ELSE
Statements (false task)
	IF (expression) THEN line number
	ELSE
	Statements (false task)

Q.10 Discuss FOR NEXT loop.

FOR NEXT Loop:-

If we know that how many times the loop must be repeated the FOR NEXT loop is used. FOR loop is used to repeat a set of statements to a specific number of times.

Syntax:

FOR variable = X TO Y [STEP z]

-
-

NEXT [variable]

The numeric variable used with FOR is called the loop control variable or loop variable, x and y are numeric constants where x gives the initial or starting value of the loop and y gives the final value, z followed by keyboard STEP gives the increment in x till y is reached. The increment can be negative also.

Q.11 Define loop and Nested loop.

Loop :-

A set of statements which are executed again and again up to fixed number of times or until a certain condition is fulfilled is called loop. For ... Next and While ... Wend

Nested Loop

A loop (FOR or WHILE) there can be one or more loops, such types of loop as nested loop

, WHILE WEND Loop.

While wend Loop:-

The while loop keeps repeating an action until an associated condition becomes is useful where the programmer does not know in advance how many times will be executed.

Syntax:

WHILE expression

•
•
•

[loop statements]

•
•
•

WEND

The body of the loop is executed until the condition is true. As soon as it becomes false, the loop terminates immediately and the program control transfers to the statement next to the WEND statement.

Q.13 Differentiate between FOR NEXT and WHILE WEND loop.

FOR NEXT Loop	*WHILE WEND Loop*
1. FOR NEXT Loop depends upon number of iteration.	1. While wend loop depends upon condition.
2. FOR NEXT Loop execule until the fixed number of time.	2. While wend loop executed until the condition becomes false.
3. For increment "Step" is used For-Next loop.	3. Step is not used with WHILE WEND loop.

Q.14 Which one loop is better in the situation where you don't know the number of iteration prior to the execution of the loop?

When a loop know the number of iteration foe execution of loop then WHILE WEND loop is best to use because it executed until the condition becomes false. FOR NEXT loop is useful only when we know the number of iterations.

Nested Loop

Any loop (FOR or WHILE) there can be one or more loops, such types of loop as nested loop

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Q.15 Write a program to calculate the area of a triangle. The program should get the values for base and altitude of the triangle from the user, and display the result. [Hint: area = ½ x base x altitude]

```
10 CLS
20 INPUT "Enter Base = ", B
30 INPUT "Enter Altitude=", A
40 AREA = (B*A)/2
50 PRINT "Area of the triangle="; AREA
60 END
```

Q.16 Write a program to calculate area and circumference of a circle. The program should get the radius of the circle from the user and display the result. [Hint: area = 3.14 x radius x radius, and circumference = 2 x 3.14 x radius]

```
10 CLS
20 INPUT "Enter Radius"; R
30 AREA = 3.14*R^2
40 Circumference = 2*3.14*R
50 PRINT "Area of the Circle is="; Area
60 PRINT "Circumference of the circle is="; Area Circumference
70 END
```

Q.17 Write a program to print first ten odd numbers using WHILE WEND loop.

```
10 CLS
20 A = 1
30 WHILE A <=21
40 PRINT A
50 A = A + 2
60 WEND
70 END
```

Q.18 Write a program to print the sum of squares of first five even numbers using FOR NEXT loop.

```
10 CLS
20 SUM = 0
30 FOR A = 2 TO 10 STEP 2
40 SUM = SUM + A
50 SUM2 = SUM * SUM
```

```
40 NEXT A
50 PRINT "The sum of first five even integers is", Sum
60 PRINT "The square of the first even integers", SUM2
70 END
```

Q.19 Write a program to find the larger of two numbers. The program should get the numbers from the user.

```
10 CLS
20 INPUT "Enter first Value =";A
30 INPUT "Enter Second Value =";B
40 If A > B then largest = A
50 If B > A then largest= B
60 PRINT "The Largest value is =", Largest
70 END
```

Q.20 Write a program to print the table of a given number. The program should get the number from the user.

```
10 cls
20 input "Enter the number for table", N
30 For A = 1 to 10
40 T = A*N
50 Print N, "*", A, "=", T
60 Next A
70 End
```

Q.21 Write a program that should accept obtained marks of a student in an examination. It should then calculate the percentage and assign a grade to the student. The grade should be assigned according to the following criteria.(given in book)

```
10 CLS
20 INPUT "Enter Students's Name:", SName$
30 INPUT "Enter Father's Name:", FName$
40 INPUT "Obtained Marks in English Out of 150:", English
50 INPUT "Obtained Marks in Urdu out of 150:", Urdu
60 INPUT "Obtained Marks in Math out of 100:", Math
70 INPUT "Obtained Marks in Physics Out of 100:", Physics
80 INPUT "Obtained Marks in Chemistry out of 100:", Chemistry
```