

I Speak BASIC to My Commodore 64™

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EXAM SET

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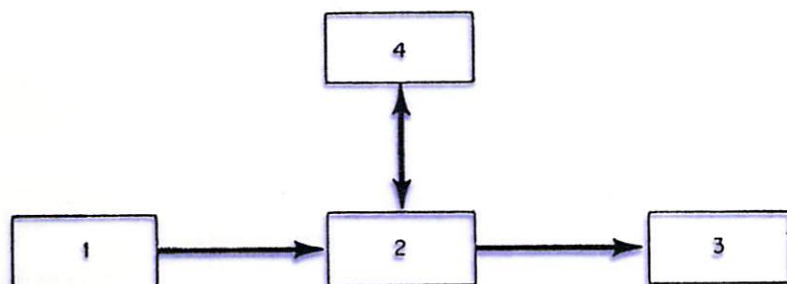
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QUIZ #1

Hardware (the Machines)



I. Above is a BOX DIAGRAM of a computer. Place the correct number beside the words that the boxes represent.

- _____ Memory Unit
- _____ Output Unit
- _____ Processor Unit
- _____ Input Unit

II. What is the major difference between a computer and a person?

III. Match Column A with Column B.

- | A | B |
|---------------------------|-------------------------------------------------------------|
| 1. _____ Keyboard | A. Binary conditions |
| 2. _____ Microprocessor | B. Computer and computer-related equipment—the machines |
| 3. _____ Tape Recorder | C. Interprets, controls, and/or calculates |
| 4. _____ Software | D. An input device |
| 5. _____ Input Unit | E. A very small processor that is part of a microcomputer |
| 6. _____ Output Unit | F. Video output device |
| 7. _____ Memory | G. The instructions or computer program |
| 8. _____ Processor | H. Stores or remembers information |
| 9. _____ Hardware | I. Means input/output |
| 10. _____ I/O | J. An input/output device |
| 11. _____ Display | K. Results and answers |
| 12. _____ 0's and 1's | L. Data and instructions |
| 13. _____ RAM | M. Read Only Memory |
| 14. _____ Volatile Memory | N. Random Access Memory |
| 15. _____ ROM | O. Information stored in memory is destroyed if power fails |

QUIZ #2

Software (the "Program")

1. The computer and related equipment are called the _____ (hardware, software) but are also known as the _____ (machines, program).
2. The set of instructions for the computer is called the _____ (hardware, software) and is also known as the (machines, program) _____.
3. Computers speak in _____ language.
4. Machine language is a form of binary coding where binary is a word meaning _____.
5. The binary codes can be either a _____ or _____.
6. The language you use to write programs for the Commodore 64 is called _____.
7. The part of the computer that translates BASIC instructions into machine code is called the _____.
8. The computer will start executing a program at the _____ (lowest, highest) line number unless told to start elsewhere.
9. When using line numbers, we normally use some multiple of 10 to leave space for _____.
10. To program you must learn the _____ first.

QUIZ #3

Your First Computer Program

- To clear memory of any program that may be stored there, the command to use is
a. STOP b. **SHIFT** c. NEW d. RUN
- A command that tells the computer to execute the program beginning at the lowest-numbered line is
a. NEW b. RUN c. LIST d. PRINT
- A command that tells the computer to display the program at Line 30 is
a. LIST 30 c. RUN 30
b. PRINT 30 d. STOP 30
- A command that tells the computer to display all of your program lines starting with the lowest number is
a. RUN b. NEW c. LIST d. END
- A command that tells the computer to display all program lines starting at Line 30 to, and including, Line 50 is
a. RUN 30-50 c. PRINT 30-50
b. NEW 30-50 d. LIST 30-50
- If you wish to insert a space between printed lines, you would use the following program statement
a. 15 PRINT SPACE c. 15 PRINT
b. 15 SPACE d. 15 LIST
- If you wish to print the word "Leeds," you would use
a. 10 PRINT LEEDS c. 10 PRINT "LEEDS"
b. 10 LIST LEEDS d. 10 LIST "LEEDS"
- The statement that will print the value of the variable A
a. 10 LIST A c. 10 PRINT A
b. 10 LIST "A" d. 10 PRINT "A"
- The last statement of most programs (optional in Commodore 64) that ends program execution is
a. 99 HALT c. 99 HOME
b. 99 STOP d. 99 END
- A program statement that is never printed out but helps the programmer to understand the program when he/she reviews it
a. 10 PRINT c. 10 REM
b. 10 NEW d. 10 MEM
- Pressing this special function key tells the computer to "look at" or to enter what you have just typed
a. **STOP** c. **RETURN**
b. **SHIFT** d. **PRINT**
- The first part of any BASIC program statement:
a. Key Word c. Enter
b. Line Number d. Variable
- A button on the keyboard that lets you restart your computer if it "freezes up" on you (i.e., if you cannot type anything) is
a. **CTRL** c. **RESTORE**
b. **CLR/HOME** d. **RETURN**
- Some keys have two characters or symbols. The key that lets you get the upper characters is
a. **CTRL** c. Space
b. **SHIFT** d. **RESTORE**
- A special key stops execution. You may type CONT and press **RETURN** if you wish to continue
a. **SHIFT** c. Space
b. **CTRL** d. **RUN/STOP**
- Write a program to print your name, address, and telephone number on separate lines. Also, put a space between your name, address, and telephone number when printed.



QUIZ #4

More Programming Tools

1. List the order of mathematical operations. That is, if you have addition, subtraction, multiplication, and division, which comes first?
2. List the math symbols used with VIC.
Multiply _____ Add _____
Divide _____ Subtract _____
Exponentiate (raise to a power) _____
3. If there are parentheses, the computer starts its mathematical operation at
a. Outermost parentheses c. Leftmost parentheses
b. Innermost parentheses d. None of these
4. Make sure that every left parenthesis has a matching _____ parenthesis.
a. Inner c. Right
b. Outer d. Left
5. Use parentheses around operations you want to perform
a. Last c. First
b. Second d. Third
6. A mathematical operation usually starts from the
a. Right and goes left c. Middle and goes right
b. Left and goes right d. Middle and goes left
7. Mark T or F next to the variables that can be used with VIC BASIC.
A _____ AA _____ 4L _____ H _____
1A _____ P4 _____ Q1 _____
B1 _____ LL _____ FZ _____
8. A _____ packs items close together on the same line (comma, semicolon) but a _____ leaves spaces (comma, semicolon).
9. There are _____ PRINT zones.
10. A _____ (comma, semicolon) causes the computer to PRINT an item at the next PRINT zone.
11. Write a program to find the area of a rectangle if length is 50 inches and width is 6 inches.
a. Have the computer PRINT the "LENGTH IS _____ INCHES"
b. Have the computer PRINT the "WIDTH IS _____ INCHES"
c. Have the computer PRINT the "AREA IS _____ SQ. INCHES"

REVIEW QUIZ #1

1. To correct a typing mistake *before* you press the **RETURN** key, you can use the following key to erase the letter(s), word(s), or line

a.  b.  c. **INST/DEL** d. **CLR/HOME**

2. One simple way to delete a program line that you do not want is to first type the line number and then press the following key

a. **RUN/STOP** c. **RETURN**
b. **SHIFT** d. **CLR/HOME**

3. To change or correct a program line after you have pressed **RETURN**, you must do the following (assume you cannot use cursor control keys).

a. Erase the line using the **RESTORE** key.
b. Retype the line.
c. Back space the line.
d. **RUN/STOP** the line.

4. To output your answers or results on the display, the following key word must be used in your program

a. Input b. LET c. Output d. PRINT

5. When using a REM statement, sometimes you see the statement written as follows

5 REM *** AREA OF RECTANGLE PROGRAM ***

What are the *** used for in the statement?

a. Multiplication c. Subtraction
b. Division d. Decoration

6. The statement **10 PRINT A** will

a. Print the letter A.
b. Print the value of A.
c. Print both the letter and its value.
d. None of the above.

7. List the order of mathematical operations. That is, if you have addition, subtraction, multiplication, and division, which comes first, second, and so on.

8. List the math symbols used with VIC.

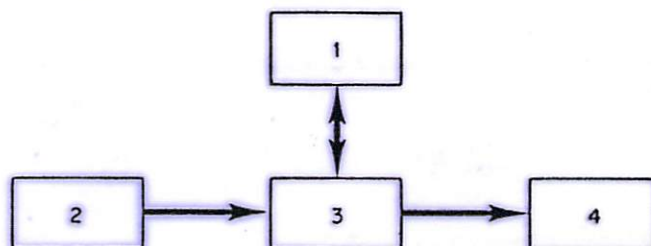
Multiply _____ Add _____
Divide _____ Subtract _____

9. Express the following in scientific notation (i.e., as it would appear on Commodore 64)

a. 5,000,000,000 = _____
b. 0.000005 = _____
c. 120,000,000,000 = _____
d. 0.00000000009 = _____

10. To clear memory of any program that may be stored there, the command to use is

a. STOP b. ERASE c. NEW d. RUN



Above is a BOX DIAGRAM of a computer. Place the correct number beside the words the boxes represent.

Memory Unit _____ Processor Unit _____
Output Unit _____ Input Unit _____

12. Write a program to PRINT on separate lines

a. Your name
b. Your address
c. Your telephone number

13. Write a program to find the area of a rectangle if length is 10 inches and width is 25 inches.

a. Have the computer PRINT the "LENGTH IS _____ INCHES"
b. Have the computer PRINT the "WIDTH IS _____ INCHES"
c. Have the computer PRINT the "AREA IS _____ SQ. INCHES"

QUIZ #6

Relational Operators and IF-THEN/GOTO Statements

1. Fill in the following table with the proper symbol

Meaning	Symbol
a. Equal	_____
b. Greater Than	_____
c. Less Than	_____
d. Is Not Equal To	_____
e. Less Than or Equal To	_____
f. Greater Than or Equal To	_____

2. Given: A = 5, B = 10, C = 30

Fill in the following table (assume the next program line is line 20):

Statement	Condition is (T OR F)*	Branch to (Line #1)*
a. 10 IF A = B THEN 40	_____	_____
b. 10 IF A <> B THEN 50	_____	_____
c. 10 IF A > B THEN 60	_____	_____
d. 10 IF A < B THEN 70	_____	_____
e. 10 IF C <= (A + B) THEN 80	_____	_____
f. 10 IF C >= (A + B) THEN 90	_____	_____
g. 10 IF B > A THEN 100	_____	_____
h. 10 IF B/A > C/A THEN 110	_____	_____
i. 10 IF A*B <= A*C THEN 120	_____	_____
j. 10 IF C/A = A*B THEN 130	_____	_____

*If condition is false (F), the computer will execute the next line in the program, which would be Line 20.

3. The IF-THEN statement is known as a/an _____ branching statement.

- | | |
|------------------|-------------|
| a. Unconditional | c. Indirect |
| b. Conditional | d. Direct |

4. If the conditions cannot be met in an IF-THEN statement, the program will

- | | |
|--------------------------|------------------------------------------|
| a. Stop | c. Branch to another part of the program |
| b. Continue to next line | d. GOTO beginning of the program |

5. The GOTO statement is known as a/an _____ branching statement.

- | | |
|------------------|-------------|
| a. Unconditional | c. Direct |
| b. Conditional | d. Indirect |

6. If you have a program that continues to run because of an unconditional branch statement, what should you do to stop the program?

- | | |
|----------------------------|------------------------------|
| a. Type STOP | c. Press RUN/STOP key |
| b. Press RETURN key | d. Press SHIFT key |

7. When you want to output something to the video display, the key word in a program statement is

- | | |
|-----------|----------|
| a. OUTPUT | c. PRINT |
| b. GOTO | d. ENTER |

8. Write a program to count to 10 by 1's using the IF-THEN statement.

QUIZ #7

The INPUT Statement

1. When you use an INPUT statement in your program, it causes the computer to stop and wait for input from the

- a. Display
- b. Tape Recorder
- c. Keyboard
- d. Memory

2. When you use a trailing semicolon in a PRINT statement (that is, the semicolon is at the end of the line), it causes the computer to

- a. Leave a space between two PRINT lines.
- b. Hook two PRINT lines together.
- c. Leave a space for a number.
- d. Add a PRINT Line.

3. When you use an INPUT statement and RUN your program, what happens when the computer stops and waits for you to enter a number and you do not enter anything?

- a. The computer waits 10 seconds and continues.
- b. The program will just stay at the line until you take some action.
- c. An alarm will sound.
- d. An error will appear.

4. Study the following program lines and then answer the question.

```
20 INPUT "YOUR NAME";     ?
30 INPUT "YOUR AGE";     ?
40 INPUT "YOUR TELEPHONE NO.";     ?
50 INPUT "YOUR SCHOOL'S NAME";     ?
```

a. Which variable can be used for Line 20?

A. AS

b. Which variable can be used for Line 30?

B. BS

c. Which variable can be used for Line 40?

C. CS

d. Which variable can be used for Line 50?

D. DS

5. If AS is used as a variable, it is called a _____ (string, numeric) variable.

6. If A is used as a variable, it is called a _____ (string, numeric) variable.

7. To insert a space between string variables, you must use

- a. Commas
- b. Semicolons
- c. Quotation Marks
- d. Colons

8. In the following table, mark True (T) or False (F) if the correct variable is used.

- a. 10 INPUT "YOUR NAME IS"; AS _____
- b. 20 INPUT "YOUR HOUSE NUMBER IS"; A _____
- c. 30 INPUT "YOUR STREET NAME IS"; B _____
- d. 40 INPUT "YOUR ZIP CODE IS"; BS _____
- e. 50 INPUT "YOUR SCHOOL'S NAME IS"; CS _____

9. To change or correct a program line after you have pressed **RETURN**, you must do the following (assume you do not have cursor control).

- a. Erase the line using the **RUN/STOP** key.
- b. Retype the line.
- c. Back space the line.
- d. **RESTORE** the line.

10. The key word to output on the display is _____.

REVIEW QUIZ #2

1. To correct a typing mistake *before* you press the **RETURN** key, you can use the following key to erase the letter(s), word(s), or line

- a.  b.  c. **INST/DEL** d. **RESTORE**

2. One simple way to delete a program line that you do not want is to first type the line number and then press the following key

- a. **RUN/STOP** c. **RETURN**
b. **SHIFT** d. **CLR/HOME**

3. To change or correct a program line after you have pressed **RETURN**, you must do the following (assume you cannot use cursor control keys).

- a. Erase the line using the **RESTORE** key.
b. Retype the line.
c. Back space the line.
d. **RUN/STOP** the line.

4. To output your answers or results on the display, the following key word must be used in your program

- a. Input c. Output
b. LET d. PRINT

5. In a computer program, the following statement is used

10 INPUT "YOUR AGE"; ?

What variable can be used for your age?

- a. A\$ b. B\$ c. 2A d. A

6. In a computer program, the following statement is used

20 INPUT "YOUR NAME"; ?

Which variable can be used for your name?

- a. A b. B c. A\$ d. A1

7. When using a REM statement, sometimes you see the statement written as follows

5 REM *** AREA OF RECTANGLE PROGRAM ***

What are the *** used for in the statement?

- a. Multiplication c. Subtraction
b. Division d. Decoration

8. When you use the INPUT statement in a program, the computer will stop when it gets to that line and wait for

- a. An input from the tape recorder.
b. A shift command.
c. An input from the keyboard.
d. An input from the disk.

9. The statement: 10 PRINT "A" will

- a. Print the letter A.
b. Print the value of A.
c. Print both the letter and its value.
d. None of the above.

10. You are running or executing a program and your output is too large for all of it to fit on the screen. The display continues to "roll" until it reaches the end. You can *slow down* the display by pressing the following key

- a. **SHIFT** c. **RUN/STOP**
b. **RESTORE** d. **CTRL**

11. Examine the following program

```
10 LET K = 0
20 K = K+1
30 PRINT K; K/2
40 IF K < 10 THEN 20
```

- a. The program is called a _____ program.
b. Line 10 in the program sets the counter (K) to _____.
c. Line 20 increments the counter (K). That means it _____ 1 to the counter each time step 20 is executed.
d. This program will loop how many times?
e. Which line determines how high this program will count _____?
f. Line 30 is the _____ (INPUT, OUTPUT) statement and it will cause the screen to display the following: (Show what the output of this program will look like.)

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

12. Write a program that will PRINT the four times table from 1 to 5. That is, your output should look like the following 4*1 = 4

```
4*2 = 8
4*3 = 12
4*4 = 16
4*5 = 20
```

(Hint: Use the counting program.)

QUIZ #10

Using the FOR-NEXT...STEP Statements

- Study the following program
10 FOR J = 10 TO 1 STEP-2
20 PRINT J;
30 NEXT J
 - The output of this program is _____.
 - The semicolon in Line 20 causes the output to be printed on the _____ (same, next) line.
 - If in Line 10 we change the STEP-2 to STEP-3, the output would then be _____.
 - If in Line 10 we change the STEP-2 to STEP-4, the output would be _____.
 - FOR-NEXT is called a _____ (conditional, unconditional) statement.
- If the step in a FOR-NEXT statement has a negative value, the counter is decremented, which means it is _____.
- If the step in a FOR-NEXT statement has a positive value, the counter is incremented, which means it is _____.
- If the key word STEP is not used with a FOR-NEXT statement, the counter is automatically increased by _____ each time.
- Sometimes the FOR-NEXT loop is called a _____ (smart, dumb) loop; whereas a GOTO loop is called a _____ (smart, dumb) loop.
- FOR and _____ are always used as a pair.
- Write a program using FOR-NEXT-STEP that will count to 100 by 10's.
- Write another program using IF-THEN that will count to 100 by 10's.

QUIZ #11

Reading Data

1. Study this short program and predict the output.

```
10 DATA 121, 671, 531, 651, 791
20 READ A, B, C, D, E
30 PRINT A; B; C; D; E
```

Output is _____

2. Study this program and predict the output.

```
10 DATA 500, 400, 300, 200, 100
20 FOR N=1 TO 5
30 READ A
40 PRINT A
50 NEXT N
```

Output is _____

3. Study this program and predict the output.

```
10 READ X
20 RESTORE
30 READ Y
40 RESTORE
50 PRINT X, Y
60 DATA 50, 60
```

Output is _____

4. Study this program and predict the output.

```
10 DATA "JONES,A.B.", LEEDS, "METZ, BILL",
COMPUTER
20 DATA JORDAN,ALICE, TEACHER
30 READ A$, B$, C$, D$, E$
40 PRINT A$, B$, C$, D$, E$
```

Output is _____

5. If there are more data elements than READ variables

- Computer stops.
- OD Error indicated.
- Some data elements are not read.
- None of the above.

6. If there are more READ variables than there are data elements

- Out of data error indicated.
- Some data elements are not read.
- BS error indicated.
- None of the above.

7. In a DATA statement, data elements are always separated by

- Colons
- Periods
- Commas
- Semicolons

8. The following is true about placement of DATA statements in a program

- They may appear anywhere in the program.
- They must be the first statement in the program.
- They must follow READ statements.
- They must be the last statement in the program.

9. The READ _____ statements work together to input data into the computer.

- GOTO
- IF-THEN
- INPUT
- DATA

10. Data Lines are always read from

- Right to left
- Left to right
- Middle to left
- Middle to right

11. If string values (words, letters, names) in DATA statements include colons, commas, or blanks, you must

- Enclose these values in quotes.
- Enclose these values in parentheses.
- Enclose values in commas.
- Enclose values in semicolons.

12. Data items are read sequentially starting with

- Last item in last DATA statement.
- First item in first DATA statement.
- First item in first READ statement.
- Last item in last READ statement.

13. The first time a READ is executed

- The first value in the first DATA statement is read.
- The last value in the first DATA statement is read.
- The last value in the last DATA statement is read.
- None of the above.

14. The RESTORE statement is used

- When data is to be read more than once in the same program.
- When data is to be printed more than once.
- When data is to be erased.
- None of the above.

QUIZ #12

Video Display Graphics

1. The Commodore 64 display has _____ character positions.


- a. 3,000
- b. 5,000
- c. 1,000
- d. 2,000

2. The Commodore 64 display has _____ rows and _____ columns.

3. Each character position is a

- a. 6 × 6 dot matrix
- b. 12 × 12 dot matrix
- c. 8 × 8 dot matrix
- d. 64 × 64 dot matrix

4. To use the right side graphics, you must also hold down the _____ key.

- a. RETURN
- b. CTRL
- c. SHIFT
- d. 

5. If you wanted to print your name ten spaces from the left side of the display, you would use:



- a. 10 PRINT (10) "NAME"
- b. 10 PRINT NAME; (10)
- c. 10 PRINT TAB (10) "NAME"
- d. 10 PRINT (10) TAB; "NAME"

6. If you wanted to start printing your name five spaces from the left side of the display and also insert ten spaces between your first name and last name, you would use:

- a. 10 PRINT (5) "FIRST NAME"; (10) "LAST NAME"
- b. 10 PRINT TAB (5) "FIRST NAME" TAB (10) "LAST NAME"
- c. 10 PRINT TAB (5) "FIRST NAME" SPC (10) "LAST NAME"
- d. 10 PRINT TAB (10) "FIRST NAME" TAB (5) "LAST NAME"

7. For TAB (N) and SPC (N), N can have a numerical value which ranges from _____ to _____.

- a. 1 to 1000
- b. 1 to 255
- c. 0 to 255
- d. 0 to 1000

8. Using your Graphics Character Reference Charts or the Commodore 64 keyboard, write beside the graphic symbol the key you would press to display the symbol (assume  or  key is already pressed, as shown).

- a. Top-left corner
- b. Bottom-right corner
- c. Horizontal line (top segment)
- d. Horizontal line (bottom segment)
- e. Vertical line (leftmost segment)
- f. Vertical line (rightmost segment)
- g. Thin bar (top)
- h. Thick bar (bottom)
- i. "X"
- j. Cross

Key

	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____
	_____

9. Although one line on the display is only 40 characters long, the Commodore 64 can handle up to _____ characters using the "wrap around" feature.

- a. 255
- b. 88
- c. 100
- d. 200

10. Using Commodore 64 graphics might appear to be complicated at first but the key to understanding how to use Commodore 64 graphics better is _____.

- a. Practice
- b. Practice
- c. Practice
- d. Practice

QUIZ #13

Arrays

1. In array A(W) with the values
25, 30, 45, 55, 65

A(3) equals:

- a. 30
- b. 45
- c. 65
- d. None of these

2. Another name for a two-dimensional array is

- a. DIM statement
- b. Array-2
- c. Matrix
- d. Element

3. In a two-dimensional array, H(2,3) refers to

- a. Row 3, column 2
- b. Row 2, column 3
- c. Column 2, column 3
- d. Row 2, row 3

4. A(7) is read

- a. "A7"
- b. "A-SUB-7"
- c. "7-SUB-A"
- d. "A-PARENTHESSES-7"

5. The DIM statement lets you set the depth or number of elements per dimension in an array. If no DIM statement is used, the maximum number of elements allowed is

- a. 5
- b. 11
- c. 9
- d. 10

6. 10 DIM B(2,3) sets a two-dimensional array B to allow elements with sub

- a. 0,0 to 2,3
- b. 2,2 to 3,3
- c. 0,0 to 2,2
- d. 0,0 to 3,3

7. 10 DIM C(21) means a one-dimensional array can have sub elements that go from

- a. 0 to 21
- b. 0 to 20
- c. 1 to 21
- d. 1 to 20

For questions 8 through 10, refer to the following matrix

H	1	2	3	4	5	6
1	25	55	68	85	13	125
2	115	95	26	100	79	80
3	19	75	65	185	21	22

8. This matrix has _____ rows and _____ columns

- a. 3,6
- b. 6,3
- c. 6,6
- d. 3,3

9. The content of H(2,3) is

- a. 75
- b. 26
- c. 65
- d. 95

10. If a DIM statement was used for the matrix, it would read

- a. 10 DIM H(3,6)
- b. 10 DIM H(6,3)
- c. 10 DIM H(6,6)
- d. 10 DIM H(3,3)

QUIZ #14

INT(X), ABS(X), and RND(X) FUNCTIONS

1. INT(X) or integer function allows you to round off any number, large or small, positive or negative, into a whole number or integer. Find INT(X) for the following

<u>X</u>	<u>INT(X)</u>
a. 0.6	_____
b. -1.5	_____
c. 2.15	_____
d. -5	_____
e. 0	_____
f. 3.456	_____
g. 76.15	_____
h. -10.35	_____
i. 7.95	_____
j. -7.85	_____

2. Find the absolute value of the following numbers

<u>X</u>	<u>ABS(X)</u>
a. 12	_____
b. 0	_____
c. -12	_____
d. -357	_____
e. 3.5555	_____
f. -3.5555	_____
g. -1.175	_____
h. -0.125	_____
i. 1.01	_____
j. 0.5789	_____

3. RND(X) or random number function causes the computer to give you a surprise number

- If $N = \text{INT}(10 * \text{RND}(1) + 1)$, then N can be any number between _____ and _____.
- If $N = \text{INT}(100 * \text{RND}(1) + 1)$, then N can be any number between _____ and _____.
- If $N = \text{INT}(6 * \text{RND}(1) + 1)$ then N can be any number between _____ and _____.
- If $N = \text{INT}(4 * \text{RND}(1) + 1)$ then N can be any number between _____ and _____.

4. Random numbers are very useful for computer games because a random number is

- | | |
|------------------|--------------|
| a. Logical | c. Uniformed |
| b. Unpredictable | d. Ordered |

5. Write a simple program to generate a random number between 1 and 10, and then let the user try to guess the number. More specifically, your program should do the following at a minimum.

- Cause the computer to generate a random number between 1 and 10.
- Permit a guess of that number from the keyboard.
- Compare the random number with a guess and, if the guess equals the random number, PRINT "Right On."
- If guess does not match the random number, PRINT "You missed it! Try again!"

QUIZ #15

Subroutines

1. When a RETURN is reached in a subroutine, it passes control back to which line in the main program?

- a. The line before the GOSUB
- b. The last line in the program
- c. The line following the GOSUB
- d. The first line in the program

2. Which statement is used to call a subroutine?

- a. GOTO 3000
- b. RETURN 3000
- c. GOSUB 3000
- d. IF-THEN 3000

3. Study the following program line.

If A has a value of 4, which subroutine would be executed?

10 ON A GOSUB 1000, 2000, 3000, 4000.

- a. 2000
- b. 4000
- c. 3000
- d. 1000

4. To keep the main program from "crashing into" subroutines or executing subroutines an extra time, we use a/an _____ statement.

- a. GOTO
- b. RETURN
- c. END
- d. GOSUB

5. ON-GOSUB works like ON-GOTO except control branches to a(n) _____ specified by line numbers in the line number list.

- a. Main program
- b. Subroutine
- c. GOTO statement
- d. IF-THEN statement

For Questions 6 through 10, study the following program and then answer the questions

```
10 REM ON-GOSUB DEMO
20 INPUT "ENTER THREE NUMBERS": N1,N2,N3
```

```
30 INPUT "1=AVERAGE, 2=SUM":K
```

```
40 IF K < 1 OR K > 2 THEN 30
```

```
50 ON K GOSUB 1000,2000
```

```
60 END
```

```
1000 T=N1+N2+N3
```

```
1010 A=T/3
```

```
1020 PRINT "THE AVERAGE OF THE THREE  
NUMBERS":N1,N2,N3;"IS":A
```

```
1030 RETURN
```

```
2000 S=N1+N2+N3
```

```
2010 PRINT "THE SUM OF THE THREE  
NUMBERS":N1,N2,N3;"IS":S
```

```
2020 RETURN
```

6. If one of the numbers input in Line 20 is 0, the next line executed is

- a. 30
- b. 50
- c. 20
- d. 60

7. What is the next line executed if K = 3 in Line 40?

- a. 20
- b. 1000
- c. 30
- d. 60

8. Line 1030 passes control to Line

- a. 2000
- b. 10
- c. 60
- d. 1000

9. Line 2020 passes control to Line

- a. 1000
- b. 30
- c. 60
- d. 10

10. What line protects the subroutine from the main program?

- a. 1000
- b. 2000
- c. 60
- d. 10