Problem Solving

EVALUATION SHEET

1. Circle the letter of the definition of each of these terms.

Algorithm

a. Program written in a language the computer can translate.

(b.) Sequence of steps to be followed in performing a task.

c. Sequence of steps for correcting program errors.

d. Sequence of symbols that represents a problem to be solved.

e. None of the above.

Initialization

a. Outlining the four phases of problem solving.

b. Defining the steps to be followed in executing the program.

c. Setting up the symbolic representation of each step of the program.

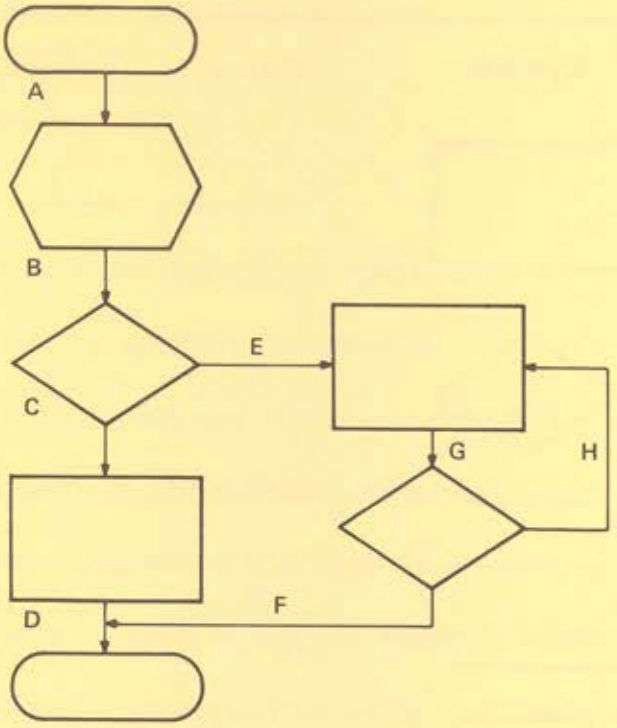
(d.) Setting up beginning conditions.

e. None of the above.

2. In the column labeled Phase of Problem Solving, write a T if the statement is a phase of problem solving. Write an F if the statement is not a phase of problem solving.

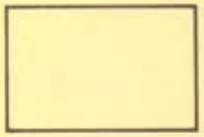
Statement	Phase of Problem Solving
Prepare a flowchart.	F
State beginning values of variables.	F
Define the problem.	T
Identify resources.	T
Choose proper computer language for the task.	F
Determine project costs.	F
Estimate program length.	F
Analyze the task.	T
Analyze the data output.	F
Verify the steps.	T

3. Each arrow in the flowchart below is labeled with a letter. In the answer space provided, write the letters of those arrows that represent flowchart *branches.* (Note that you will not need all the answer space provided.)



Answers: C E F H ___ ___ ___ ___

4. The basic flowchart symbols, their names, and their functions are given below. In the column labeled Name, write the letter that identifies the symbol's name. In the column labeled Function, write the letter that identifies the symbol's function.

Symbol	Name	Function
	f	j
	b	o
	a	m
	h	i
	c	l
	e	p
	d	k
	g	n

Names

a. The sequence symbol
b. The decision symbol
c. The initialization symbol
d. The terminal symbol
e. The predefined process symbol
f. The process symbol
g. The connector symbol
h. The I/O symbol

Functions

i. Indicates both input and output operation.

j. Symbolizes the steps that process data.

k. Marks both beginning and end of the algorithm.

l. Represents setting up beginning conditions.

m. Indicates the sequence of the steps.

n. Used to make complex flowcharts easier to understand.

o. Indicates that a choice must be made as to what to do next.

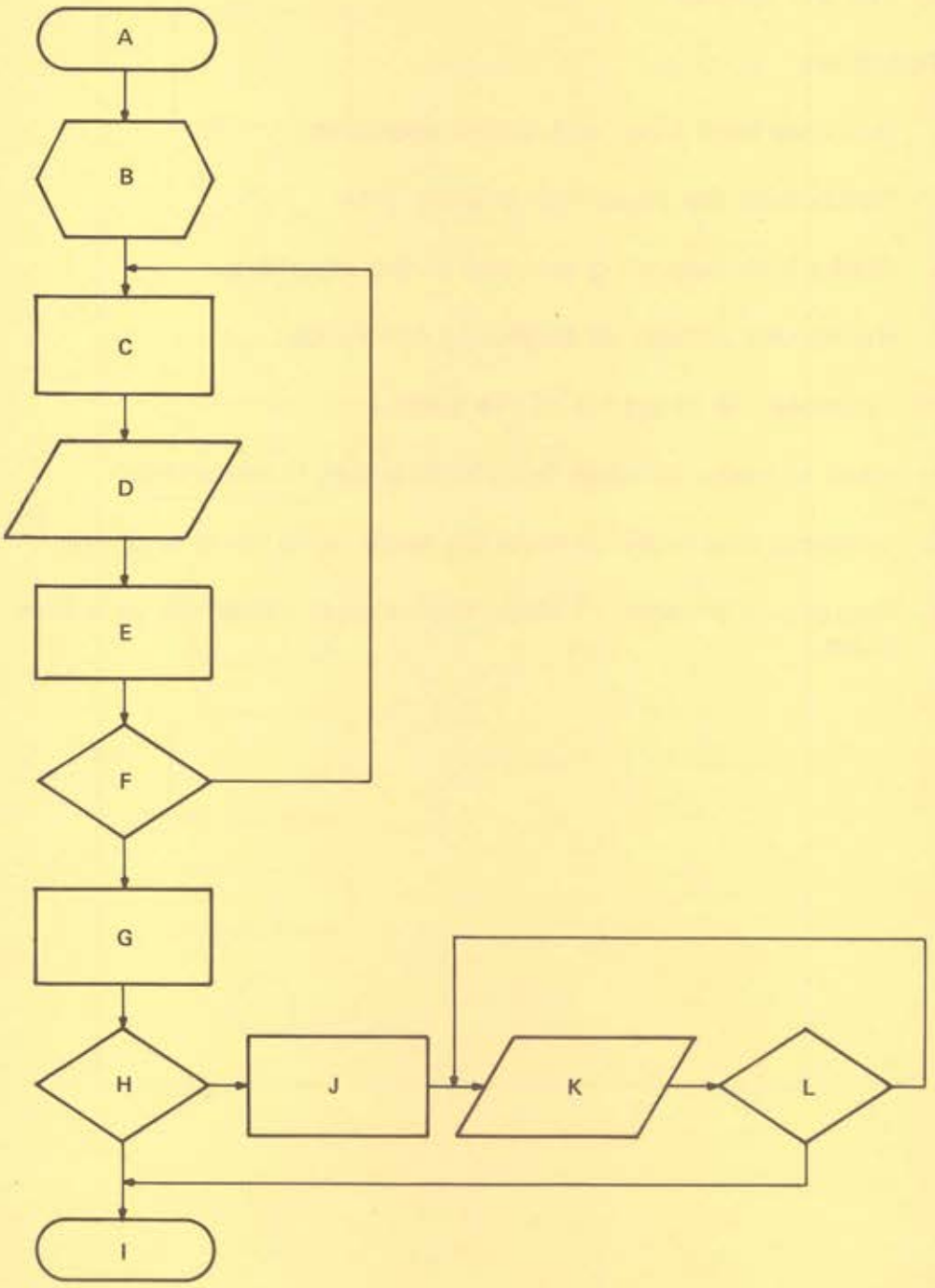
p. Represents a series of steps that appear elsewhere in a flowchart.

5. The flowchart below contains two *loops.* Each step in the flowchart is labeled with a letter. In the space provided, write the letters of all the steps included in each loop. *Place your answers in alphabetical order!*

Answers:

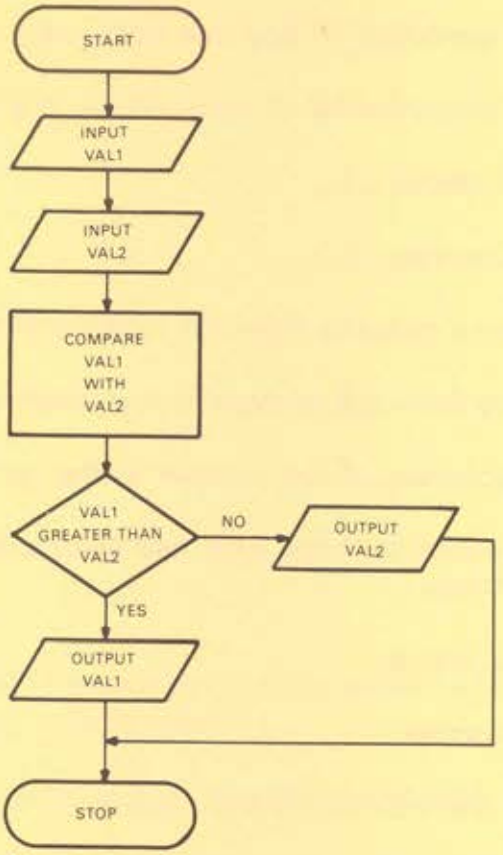
Loop 1 includes steps: C, D, E, F

Loop 2 includes steps: K, L



6. Flowchart the solution to the following problem, using the symbols described in the unit.

Input two unequal numbers and output the higher one.



7. Circle the letter of the definition of each of these terms.

Iteration

a. A single execution of any one instruction in a loop.

(b) A single execution of all instructions in a loop.

c. A repeated execution of any one instruction in a loop.

d. A repeated execution of all instructions in a loop.

e. None of the above

Decrement a Counter

(a) Subtract some quantity from the number in the counter.

b. Subtract one from the number in the counter.

c. Verify the accuracy of the number in the counter.

d. Check to determine if the loop has been executed the desired number of times.

e. None of the above.

Increment a Counter

a. Add one to the number in the counter.

b. Add any number greater than one to the number in the counter.

c. Verify the accuracy of the number in the counter.

d. Check to determine if the loop has been executed the desired number of times.

(e) None of the above.

8. The seven steps to problem solving with a computer and their descriptions are given below. Both steps and descriptions are in random order. Your task includes two parts. First, indicate each step's position in chronological order by placing the appropriate number (1 for first step, 2 for second step, etc.) in the column labeled Position. Second, write the letter that describes each step in the column marked Description.

Step	Position	Description
Code the Program	4	b
Flowchart	3	g
Document	7	f
Define the Problem	1	c
Debug	6	d
Translate	5	e
Plan the Solution	2	a

Descriptions

a. Determine what needs to be done, what resources are available, and how they will be used.

b. Write the program in a language the computer can understand.

c. Describe, in detail, what you want to do and the data you have to work with.

d. Find and correct errors in processing.

e. Transform the coded program to a form the computer can execute.

f. Collect and keep a record of all the information about the program.

g. Using symbols, draw a detailed diagram of the sequence of steps to reach the desired solution.