1 Question Bank

Construct flowcharts to show the steps involved to accomplish the following:

(1) Find the product of two numbers.

(2) Find the remainder when one number is divided by the other.

(3) Find the area of a parallelogram.

(4) Find the area of the four walls of a rectangular room.

(5) Find the area and perimeter of a circular plot.

(6) Find the area of a triangle based on the length of three sides.

(7) Find the area and perimeter of a square.

(8) Find the cost of fencing a rectangle at a given rate.

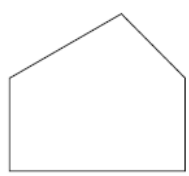
(9) Find the surface area of a cone.

(10) Find the volume and surface area of a sphere.

(11) Convert meters to kilometers.

(12) Accept the rate for a dozen bananas and the quantity required to determine the cost.

(13) Find the cost of a flat having the floor space of the following pattern:



(14) Determine the acceleration due to gravity (g), where g can be obtained from the following formula:

$$T = 2\pi\sqrt{\frac{l}{g}}$$

where T = Time period of a simple pendulum

and l = Effective length of the simple pendulum

(15) Obtain the equivalent Fahrenheit temperature of a temperature given in Celsius where the relationship between the two scales of temperature is

$$\frac{C}{5} = \frac{F-32}{9},$$

where C = Temperature in Celsius

F = Temperature in Fahrenheit

Construct flowcharts for the following problems:

(16) Print a currency conversion table for pounds, francs, marks, and lire to dollars.

(17) Find whether a given year is a leap year.

Hint. A year is said to be a leap year if it is either divisible by 4 but not by 100 or divisible by 400.

(18) Validate a given year.

Hints. The year in the date must be greater than zero, the months must lie between 1 and 12, and the days must lie between 1 and 31, depending on the month numbers.

(19) Show the time required by an advertising agency for its advertising program to run in Boston and on National Public Radio and to display the amount to be paid by the agency for its advertisement.

(20) Calculate the commission of a salesman when sales and the region of the sales are given as input. The commission is calculated with the rules as follows:

(a) No commission, if sales < \$9,000 in Region A

(b) 5.5% of sales < \$7,000 in Region B and when sales < \$13,000 in Region A

(c) 7.5% of sales when sales > = \$14,000 in Region A and when sales > = \$13,000 in Region B.

(21) Accept three integers representing the angles of a triangle in degrees to determine whether they form a valid set of angles of a triangle. If it is not a valid set, then generate a message and terminate the process. If it is a valid set, then the process determines whether it is equiangular (all three angles are the same). It also determines if the triangle is right angled (has one angle with 90 degrees), obtuse angled (one angle above 90), or acute angled (all three angles are below 90 degrees). Finally, it shows conclusion about the triangle.

(22) Accept the lengths of the three sides of a triangle to validate whether they can be the sides of a triangle and then classify the triangle as equilateral (all three sides are equal), scalene (all three sides are different), or isosceles (exactly two sides are equal), and then to see whether it is a right angled triangle (the sum of the squares of two sides is equal to the square of the third side.)

Hint. Three numbers are valid as the sides of a triangle if each one is positive and the sum of every two numbers is greater than the third.

(23) Allow the user to perform a simple task on a calculator on the basis of a given choice as follows:

+, −, ×, /, or % representing the arithmetic operators

A Average of two numbers

X Maximum of two numbers

M Minimum of two numbers

S Square of two numbers

Q Quit

Construct flowcharts for the following problems:

(16) Print a currency conversion table for pounds, francs, marks, and lire to dollars.

Construct flowcharts to show the following:

(24) Print multiplication tables from 1 to 5

(25) Sum the digits of a given number until it is reduced to a single digit

(26) Create a pyramid of numbers consisting of a given number of lines. For example, if the given number is 5, then we should see the following:

```
        1
      1 2 1
    1 2 3 2 1
  1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1
```

(26) Sum the digits of a given number

(27) A menu of fruits as given below that accepts the user's option. Calculate the cost of fruits and repeat the same until the user's option is exited. Display the cost of each item and the total amount to be paid by the customer.

Fruits Menu

	Fruits	**Cost per Pound. (in $)**
1.	Mango	5.00
2.	Apple	3.00
3.	Grapes	2.00
4.	Exit	

(28) The following patterns with flexible dimensions as supplied by the uses:

(a)

```
        ★
      ★ ★
    ★ ★ ★
  ★ ★ ★ ★
★ ★ ★ ★ ★
```

(b)

```
      ★
    ★ ★ ★
  ★ ★ ★ ★ ★
★ ★ ★ ★ ★ ★ ★
```

(29) Read a six-digit positive integer. If the number is even, add up its digits. Otherwise, multiply the individual digits and print the result.

(30) Obtain the decimal equivalent of a binary number

(31) Display all characters represented by the ASCII numbers from 25 to 100

(32) Determine the value of an exponential expression of the form a^x, where a is any number and x is any integer

(33) Determine the HCF of n given numbers

(34) Determine the maximum and the minimum ones of n given numbers

(35) Determine all the permutations of the numbers less than or equal to some given number n.

For example, if $n = 123$, then the permutations are:

123

321

231

132

213

312

(36) Find a series of five consecutive numbers, the sum of the squares of the first three of which is equal to the sum of the squares of the last two. For example,

$$(-2)^2 + (-1)^2 + 0^2 = 1^2 + 2^2$$

(37) Limit the checking within 1000, to show all the triad numbers within 10,000. A number is said to be a triad number if the double and triple of the number contain all separate digits with no repetition of any one of them.

(38) Identify and show the integer values of x, y, and z that satisfy the equation: $Z^2 = X^2 + y^2$

(b)

```
        ★
      ★ ★ ★
    ★ ★ ★ ★ ★
  ★ ★ ★ ★ ★ ★ ★
```