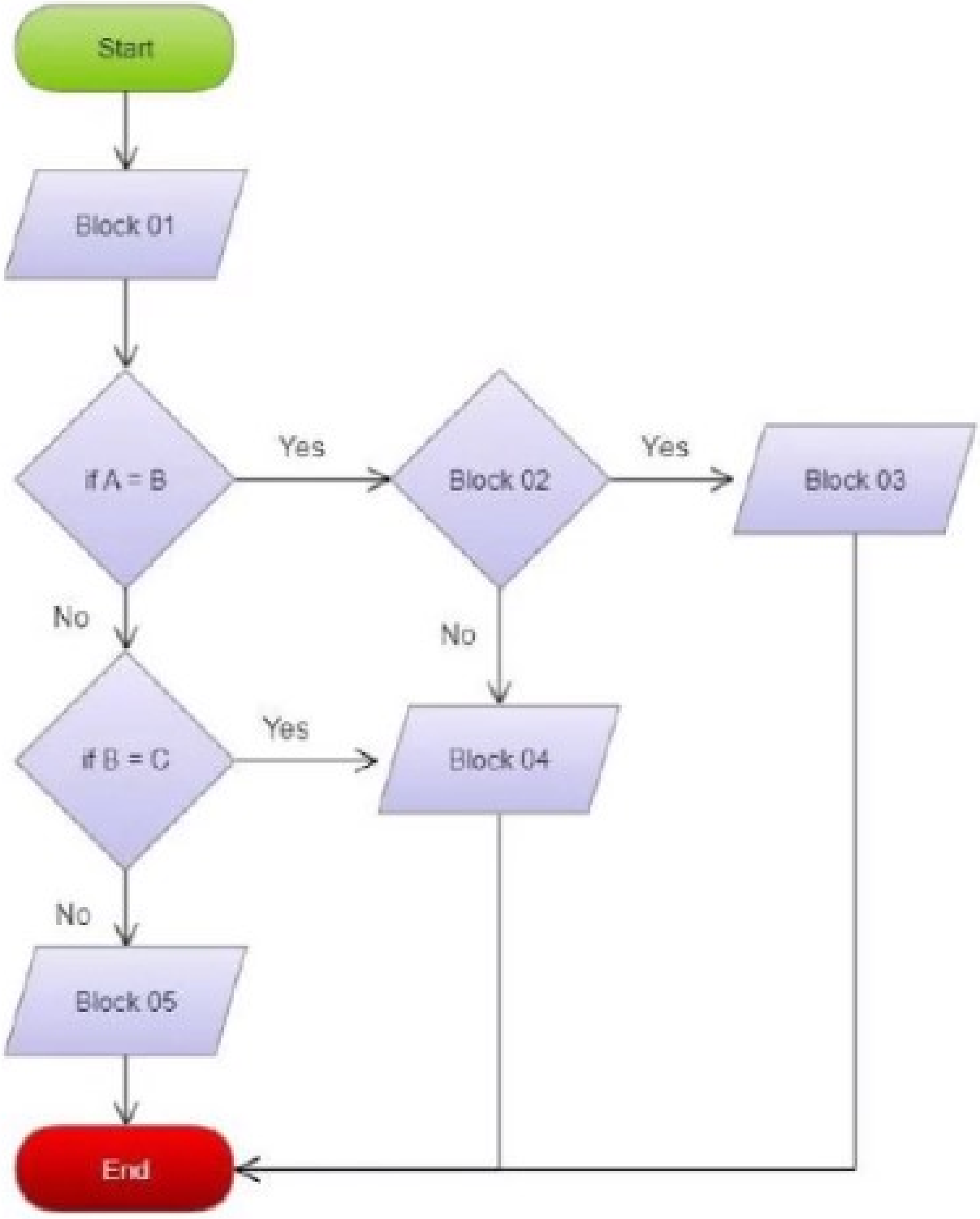
Question 01

Complete the following flowchart to do the following.

1. Input lengths of three sides of a triangle A, B, C.
2. Determine and display whether the triangle is "isosceles", "equilateral", or "scalene".

Hint: In an equilateral triangle three sides are equal.
In an isosceles triangle two sides are equal.
In a scalene triangle three sides are not equal.



Question 02

Write a C program to print the following star pattern.

```
*****
****
***
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*
*
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*****
******
```

Question 03

'Quick cleaners' offers dry cleaning service for their customers based on three service types. The service types and the price per 01 kg of items are mentioned below.

Type	Service Type	Payment for 01kg (Rs.)
1	Urgent service	750
2	One day service	500
3	Normal service	350

If the customer needs delivery service, an additional payment of one thousand will be charged.

Function **calPayment()** calculates and return the payment for the laundry service when the service type, the weight of the items and necessity of delivery are passed as parameters.

If the customer needs delivery service, value "Y" will be passed to the function and otherwise, value "N" will be passed.

Write a suitable **function prototype** for the function **calPayment()**.

Following program is written by a student to display the result of the following expression when integer number n (>0) is entered from the keyboard. There are errors in the program. Find the line numbers with errors and correct them.

A = n * (n-1) * (n-2) * .... * 1

```
1.    #include<stdio.h>
2.    int main(void)
3.    {
4.        int n, ans = 0;
5.        scanf("%d", n);
6.
7.        while (n >= 1)
8.        {
9.            ans = ans + n;
10.           n = n + 1;
11.       }
12.       printf("Result is ans \n");
13.
14.       return 0;
```

Question 05

A cab service has three types of vehicles for rental service (C- Car, V- Van, B- Bus). Rs.40.00 will be charged per kilometer from a car, Rs.50.00 from a van and Rs. 75.00 from a bus. 5.0% discount is given if the total distance is above 100 km. Discount will be given only to cars and vans. Buses will not get the discount.

Following C program is written to enter the type of the vehicle and the total distance from the keyboard. Complete the program to calculate and display the discount received.

```
#include<stdio.h>

int main(void)

{

        char type;

        int distance;

        float discount = 0;


        printf("Enter vehicle type:");

        scanf("%c", &type);


        printf("Enter total distance:");

        scanf("%d", &distance);
```

Question 06

Write a C program to input a word from the keyboard, store it in a character array called **newArr** and display the number of uppercase letters stored in the array.

Hint : ASCII value of a is 97 and z is 122.

ASCII value of A is 65 and Z is 90.

Ex.

M	a	R	k	e	t

Input word : MaRket

No. of uppercase letters : 2

Question 07

Write a C program to do the following.

1. Define a structure called **center** witch can be used to store x and y coordinates of center of a circle.

2. Declare 2 center points **C1** and **C2**.

3. Initialize **C1** and **C2** with suitable values.

4. Calculate and display the distance between the centers.

e.g if two center points are C1 (x1, y1) and C2 (x2, y2)

$$distance = \sqrt{(x1 - x2)^2 + (y1 - y2)^2}$$

Question 08

Write a C program to read covid-19 patient details(Division ID, Number of patients) of 5 divisions from the keyboard and store them in a text file called “patients.dat”.

Division ID	No of patients
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To test the given function, write **two suitable assert statements.**

This function will return displacement(s) of an object when its initial velocity (u), acceleration (a), and time (t) traveled are passed as parameters.

```
double calculate(double u, double a, double t)
{
        double s = u * t + (a * t * t) / 2;
        return s;
}
```

Sample data

Displacement (s) / m	Initial velocity (u) / ms^{-1}	Acceleration (a) / ms^{-2}	Time (t) / s
750.0	25.0	10.0	10.0
2000.0	50.0	5.0	20.0
812.5	100.0	25.0	5.0
1365.0	125.0	20.0	7.0

Question 10

You are suppose to write a C program to store 10 numbers in an array called numbers, and find whether all the stored numbers are multiples of a number (n) input by the user.

e.g. if array has numbers 2, 6, 8, 10, 4, 2, 6, 14, 20, 16 and n = 2 , output "divisible by 2"

if array has numbers 2, 6, 8, 10, 4, 7, 6, 14, 20, 16 and n = 2 , output " not divisible by 2"

Complete the following program to accomplish the above task.

```
# include <stdio.h>
int main(void)
{
        int numbers[10] = {2, 6, 8, 10, 4, 2, 6, 14, 20, 16};
        int n;
        printf("Input the value of n");
        scanf("%d", &n);
        .....
        .....
        .....
        return 0;
}
```

Question 11

getDiscountRate() function returns the discount rate for an item when the item no is given as a parameter.

displayDetails() function displays the item No, price and the amount to be paid when they are passed to the function.

When item no and the price of an item are entered from the keyboard in the main function, complete the following C program to calculate and display the amount to be paid using the given functions.

Hint: amount to be paid = price * (1 - discount rate/100)

```
#include<stdio.h>
float getDiscountRate(int itemNo);
void displayDetails(int itemNo, float price, float amountToBePaid);
int main(void)
{
        int itmNo;
        float price;
        printf("Enter Item No :"); //input values from keyboard
        scanf("%d",&itmNo);
        printf("Enter price :");
        scanf("%f",&price);

        //calculate amount to be paid after discount and
display
.....

        .....

        .....
        return 0;
```