Grade 11

Lesson One
Information & Communication Technology

Part II

1. Consider the following program segment in Pascal. (2016)

```
var num : array [0 .. 4 ] of integer;
begin
      num [0]:= 15;
      num [2]:= 18;
      num [4]:= 50;
      num [1]:= num [4] + 10;
      num [3] := num [0] + num [2];
      for i = 1 to 4 do
            writeln (num [i]);
end.
```

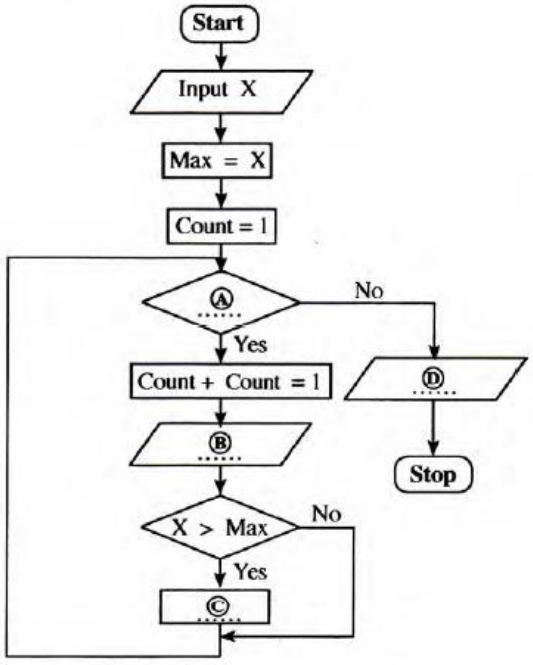
Write the output of the above program.

2. The pseudocode given below reads two numbers and displays the larger number. (2016)

```
start
        get A, B
        if A > B then
                display A
        else
                display B
        endif
stop
```

Draw a flow chart to represent the above pseudocode.

3. Suppose a school has conducted an examination of a particular subject for 100 students and recorded the marks scored. The given flowchart with blank spaces indicated by labels A to D is designed to read these marks and display the highest. (2016)
Identify and write down the appropriate statements for labels A, B, C and D.
(You are not required to copy the flowchart to your answer book)



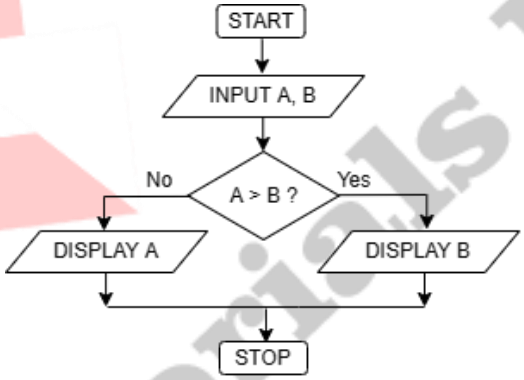
4. Assume that a dice was thrown 10 times and the 10 values obtained are stored in an array named A. The following algorithm with missing terms P, Q and R is used to calculate how many times number 5 was obtained. (2017)

Index of array	0	1	2	3	4	5	6	7	8	9
A	1	3	5	3	2	1	5	4	6	1

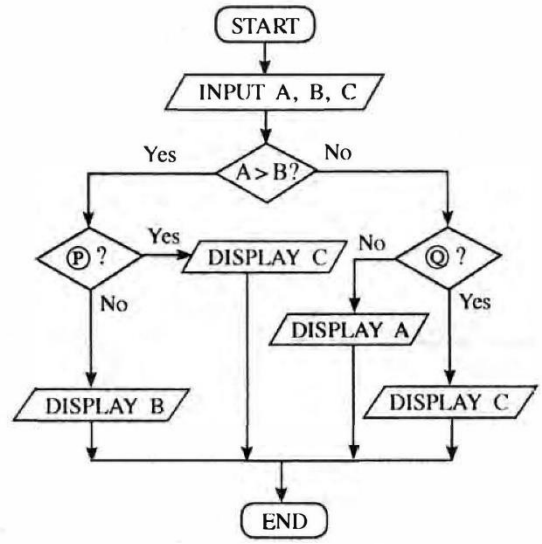
```
count = 0
i = 0
while i < P
        if A |Q| = 5 then
                R = count + 1
        end if
        i = i + 1
end while
display count
```

Write the correct terms for labels P, Q and R in the above algorithms.

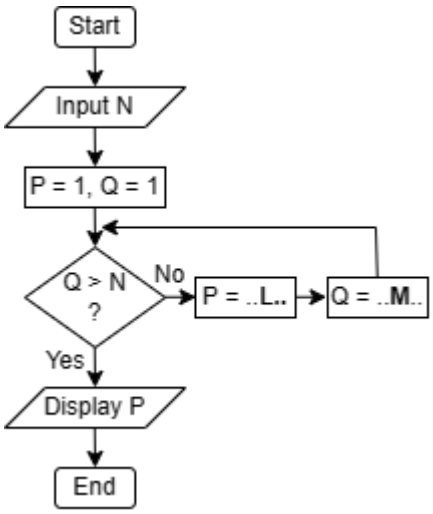
5. The following flowchart shows an algorithm that reads two numbers and display the smaller number. Write the pseudocode for the algorithm in the flowchart given above. (2017)



6. The following flowchart reads three numbers and finds the smallest. Write down the correct expressions for missing labels P and Q. (2017)



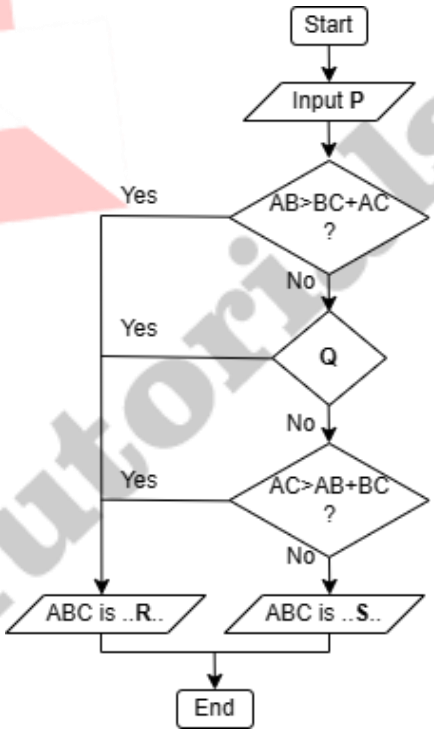
7. Consider the given flowchart that finds the product of an integer with all the integers below it. (2018)
(E.g.: If N is the given integer then the product = 1 x 2 x 3 … x N)
L and M are expressions to be completed.



a) Write the correct expressions for L and M respectively.

b) If N = 4, write down the final values of P and Q when the algorithm reaches the end.

8. The following flowchart uses the rule that the sum of any two lengths must be greater than the remaining length in a triangle. Assume that AB, BC and AC are the lengths of a triangle. (2018)



(i) Write down the correct expressions for missing labels P, Q, R and S in the flowchart.

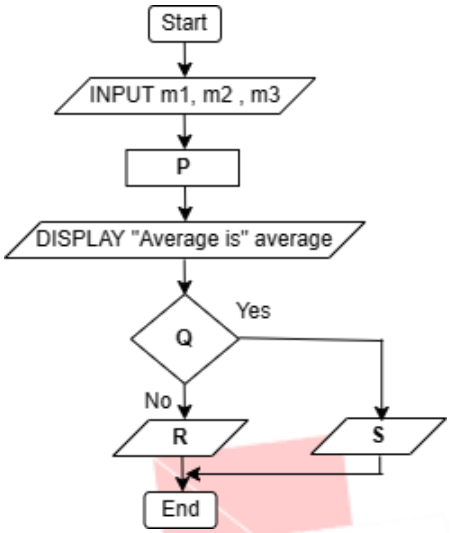
(ii) If the three decision boxes in the flowchart are combined into a single decision box, write down the expression that should be used in that single decision box.

(iii) Write pseudocode representing the logic of the updated flowchart, including the changes that were done in (i) and (ii) above.

(iv) When one or more of the input lengths become zero, this algorithm fails to function properly. Write the pseudocode condition that has to be introduced in between the input and the first decision box in the original flowchart to fix this problem.

9. Following flowchart is used to input marks of three subjects. Then it calculates the displays the average of those marks, and the pass/fail status. To be considered for a pass, the average should be greater than or equal to 40. (2019)

Identify the correct statement for each of the labels P, Q, R and S in the flowchart from the table given below. Write down the each label and its matching statement number.

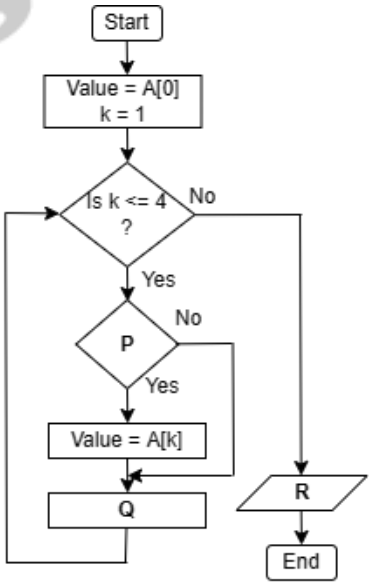


Statement Number	Statement
1	average = (m1 + m2 + m3) / 3
2	Display “Fail”
3	Display “Pass”
4	Is average < 40?

10. Consider the following array A containing five integer values. (2019)

A[0]	A[1]	A[2]	A[3]	A[4]
80	100	70	65	95

```
Begin
        Value = A[0]
        k = 1
        WHILE (k<=4)
            IF A[k] < Value THEN
                Value = A[k]
                ENDIF
                k=k+1
        ENDWHILE
        DISPLAY Value
END
```



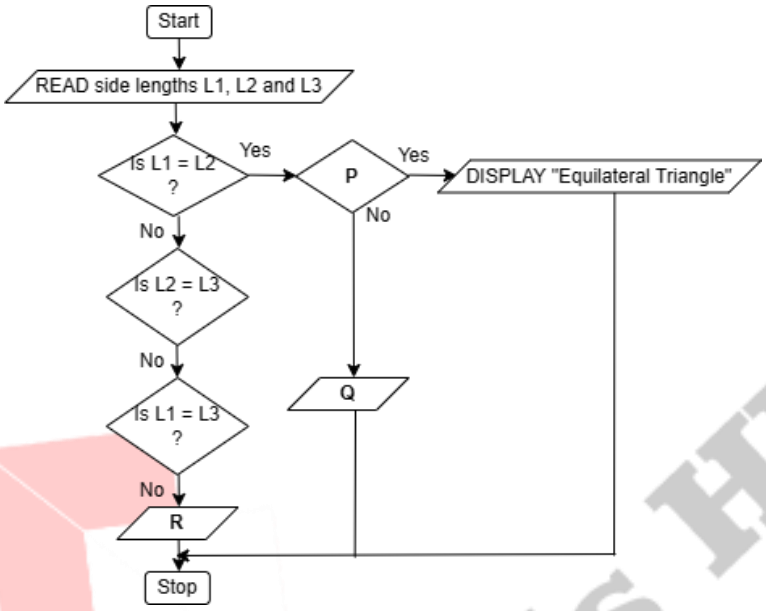
a) Write the output of the following pseudo-code when it is executed on the above array A.

b) Identify and write down the correct statements for P, Q and R in the flowchart on the right which is drawn using the above pseudo-code.

c) Redraw the array A and its contents after the following assignments are carried out on the array A.

A [1] = 45
A [2] = 88
A [4] = 72

11. A triangle with all three sides of equal length is called an equilateral triangle. A triangle with two sides of equal length is called an isosceles triangle. A triangle with all slides of different lengths is called a scalene triangle.
The following flowchart with labels P, Q, R determine if a given triangle is an equilateral, isosceles or a scalene triangle. Write down the relevant statements for the labels P, Q and R. (2019)



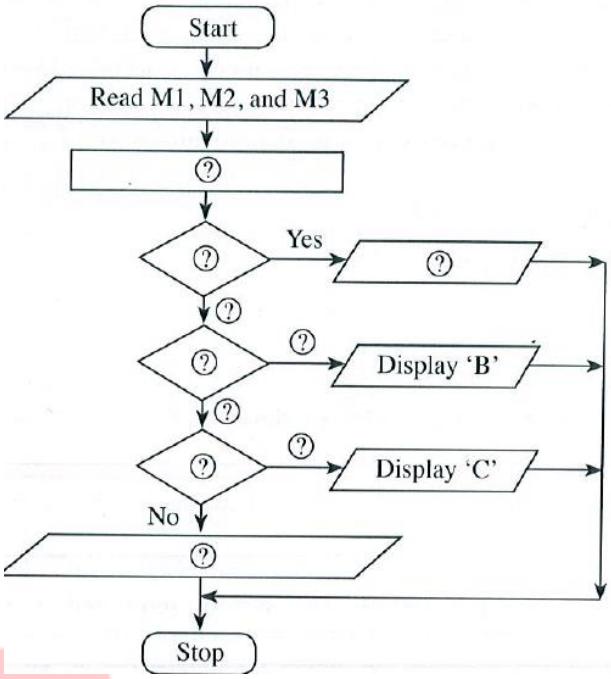
12. Consider the following Pseudo-code segment with blank spaces labelled A to C, which calculates and displays the sum of odd numbers between 0 and 10. Write down the suitable expression for A, B and C in the label → expression format. (2020)

```
BEGIN
        sum = 0
        num = 1
        WHILE ..A..
                sum = ..B..
                num = ..C..
        ENDWHILE
        DISPLAY sum
END
```

13. Write one similarity and one difference between Variables and Constants in a computer program.(2020)

14. The following flow chart is drawn to calculate average marks (avg) and display the grades when marks (M1, M2, M3) of three subjects are given as inputs. The grades are decide according to the following table. (2020)

Average marks (avg)	**Grade**
Greater than or equal to 80	A
Less than 80 and greater than or equal to 65	B
Less than 65 and greater than or equal to 50	C
Otherwise	No Grade



Copy the above flowchart to your answer script and fill the blanks indicated by "?" according to the given scenario.

15. Consider the following array A which contains zeros in all locations. (2020)

A[0]	A[1]	A[2]	A[3]	A[4]
0	0	0	0	0

```
Begin
        value = 2
        k = 0
        REPEAT
                A [k] = value
                value = value + 5
                k = k+ 1
        UNTIL k < 5
END
```

What would be the values of P, Q, R, S and T, after executing the following Pseudo-code on array A.

A[0]	A[1]	A[2]	A[3]	A[4]
P	**Q**	**R**	**S**	**T**

16. The following algorithm is used to select players for a Rugby pool. The selection is done based on the height, weight, and age of the player. (2021)

```
IF ((Age >= 21 AND (Height >= 160 OR Weight >= 70))
        Output "Qualified for the pool"
Else
        Output "Not qualified for the pool"
```

The age, height, and weight of three candidates are given below.

Name	Age	Height (cm)	Weight (kg)
Nirmal	21	159	71
Rajeev	36	165	72
Saleem	25	150	69

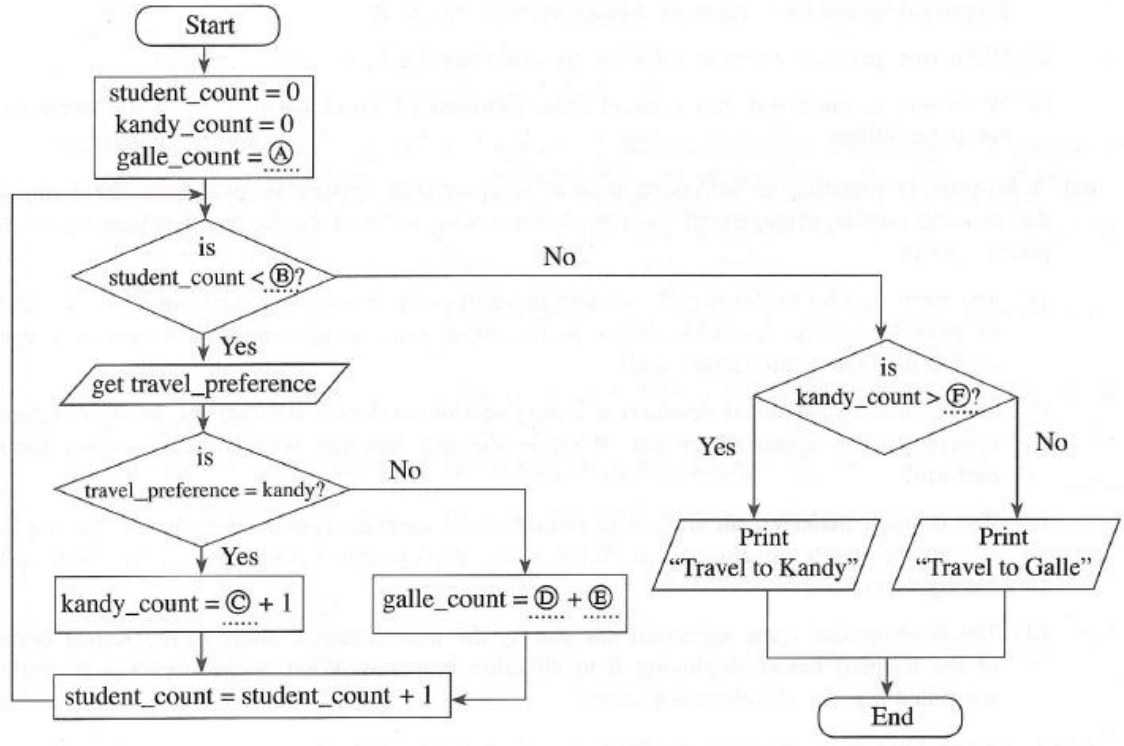
Write down the names of all players who are qualified for the pool.

17. Answer parts (a) and (b) based on the following pseudocode: (2021)

```
BEGIN
        counter = 0, x = 0
                WHILE counter < 20
                        DISPLAY "Enter a Number"
                        READ num
                        x = x + num
                        counter = counter + 1
                END WHILE
        DISPLAY x
END
```

a) What is the exact purpose of the above pseudocode?
b) What would happen if the statement "counter = counter + 1" is removed from the pseudocode?

18. A teacher asked from 50 students to choose their preferred travel destination (either Kandy or Galle) for the annual school trip. The destination will be decided based on the highest student preference. The following flowchart with blanks labelled from A to F represents this scenario. (2021)



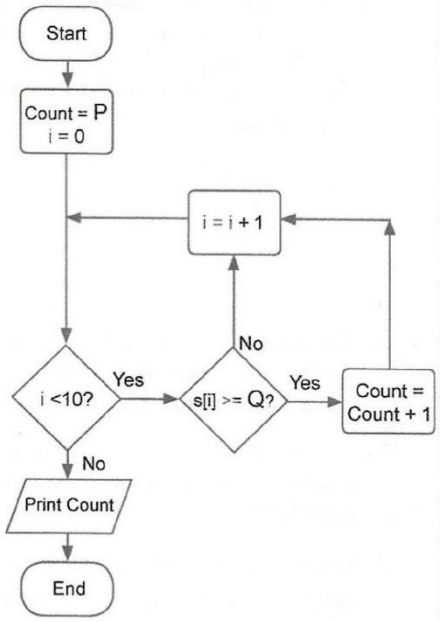
Write down the appropriate answers to match the labels A to F in the label → answer format.

19. Assume that a player can receive a score between 1 and 10 for a game. (2022)
The scores a particular player has received in 10 games are stored in an array S as follows:

S:

10	5	3	4	7	5	9	2	1	7

It is required to find how many times the player scored 5 or higher. The flowchart drawn for that purpose is shown. Write down the correct replacements for labels P and Q.



20. A student can go to school either by bicycle, school van or bus. It can be chosen based on the total distance as follows: (2022)
    - When the total distance is less than or equal to 5 km:
      Use the bicycle
    - When the total distance is more than 5 km but less than or equal to 15 km:
      If the distance from home to nearest bus stop is less than 1 km, use the bus. Otherwise use the school van.
    - When the total distance is greater than 15 km:
      If the monthly van fare is less than two times the monthly bus fare use the school van. Otherwise use the bus

    i. Write down the most suitable transportation modes (bus, van or bicycle) for Sithara, Ganesh, Salem and Nimal based on the information given below.

Student	Total Distance (km)	Distance to bus stop (km)	Monthly van fare (Rs)	Monthly bus fare (Rs)
Sithara	10	0.5	3000	2000
Ganesh	20	2	8500	4000
Saleem	14	1.5	6000	3000
Nirmal	3	0.5	2000	1200

    ii. Write a pseudocode to input the required data for a student (total distance [TD], distance to bus stop [D], monthly van fare [VF] and monthly bus fare [BF]) and to output the suitable transport mode for him/her.