KIND POSITIVE YOURSELF

National 5 SDD Assessment 2

Name	
Class Teacher	

Question 1 (1 mark)

Name suitable data types to store the following information

Computing 19	
True/False	

Question 2 (2 marks)

The program below should ask the user for a Test Mark & display "You have passed" if it is over 50. Identify the errors in the code below.

…
Line 3 GET TestMark from user
Line 4 IF TestMark < 50 then
Line 5 SEND "You have passed" to Dsplay
Line 6 End If
…

Syntax Error	
Logic Error	

Question 3 (1 mark)
Convert the following number to denary

11001101

Question 4 (1 mark)
Evaluate the output of the following code when a user enters the value 1
…
Line 3 GET number1 from user
Line 4 Number 2 = Number 1 * 5
Line 5 Total = Number 2 * 5 + 5
Line 6 Display Number 2 & Total
…

Question 5 (4 marks)
The value in number1 has to be validated between 1-100. Write input validation to ensure the user enters a number between this range.

Question 6 (1 mark)
Give 2 examples of extreme and exceptional test data for the algorithm above.

Normal	34, 45
Extreme	
Exceptional	

Question 7 (1 mark)

Describe the purpose of encryption when sending information over the internet

Question 8 (1 mark)

The SDD process is described as iterative. What does this mean?

Question 9 (1 mark)

The school wants to reduce the impact of the IT on the environment. Name 1 thing they could do.

Question 10 (2 marks)

A vector graphic is created to draw an overhead view of the school. Name the tool used to create this object & state some of the attributes that have been stored.

Question 11 (4 marks)

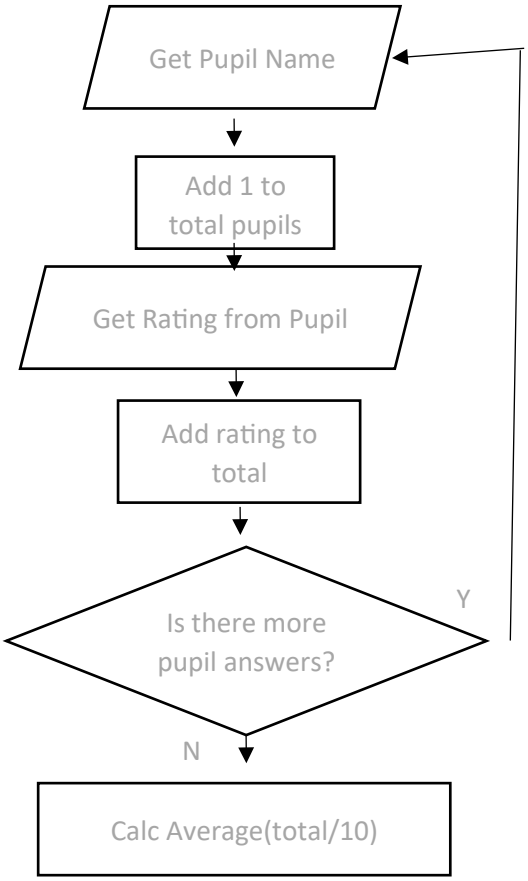
The school wants to have a pupil survey that is going to use a touch screen. They will be asked the following questions:

- Did you see any covid violations today?
- Was the school building clean?
- Rate your day out of 10

Design an interface that would be used on a tablet at the front of the school at the end of the day

Question 12

The flow chart below shows the program that will total and average the ratings



Identify a value in the flow chart that will be stored as an integer (1 mark)

Identify the condition in the conditional loop (1 mark)

The program does not calculate the average correctly. Explain why this is an how you could fix it.(1 mark)

Question 13 (6 marks)

Mr Hunter wants enter test results 1 – 100 and adds up all of the scores and calculates an average. Write an algorithm that will do this. There are 40 pupils in his class.

Question 12 (2 marks)

State a suitable data structure for storing the test scores and the data type.

Amber 87.1
Adam 34.2
David 23.2
Alice 89.6

Data Structure	
Data Type	

Where in the Computer System would the test marks be stored when the program is running? (1 mark)

Question 13

…
Line 3 GET TeamName from user
Line 4 Calculate length of TeamName
Line 5 If NOT length > 15 then AND starts with A
Line 6 Length = Length * 3
Line 7 End if
Line 8 Display answer
…

Identify 2 logical operators in the code above (1 mark)

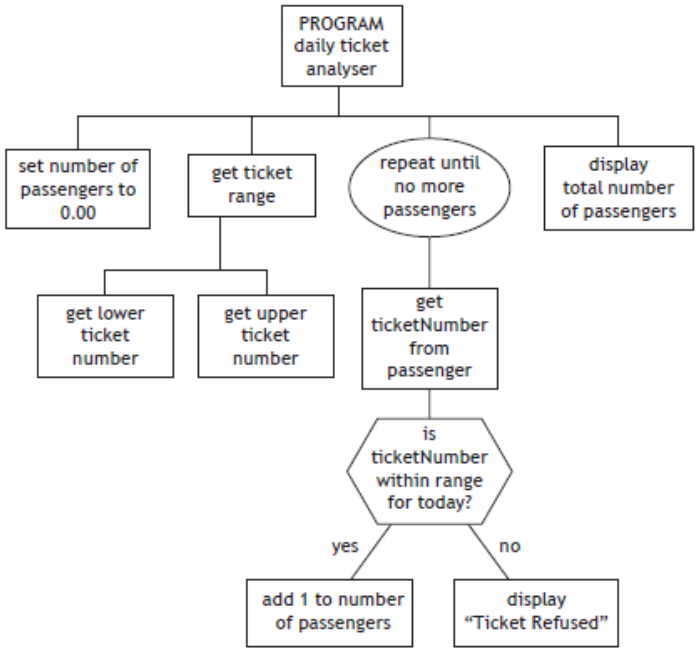
Using a function write a line of code that will calculate the length of the name variable for line 4 and store in the length variable. (1 mark)

The first name entered is “TeamBelmont”. How many bits are required to store this string using extended ASCII? (1 mark)

Question 14

A company runs a trip round Ailsa Craig every weekend. The boat holds 50 passengers.

The program design is below.



What type of loop is used in this design? (1 mark)

Which of the Algorithms is being used in this design? (1 mark)

A number of different programming constructs are being used. Complete the table below identifying which part of the flow chart demonstrates which construct. (3 marks)

Construct	Example from Flow Chart
Assignment	
Conditional Statement	
Arithmetic Operation	

Total number of passengers is set to 0.00 in the flow chart. Give a more suitable data type and explain why you have chosen this. (2 marks)

Question 15

A program uses 2 IF Statements. This is not efficient and this means both IF statements are always checked. Write the IF statements below in a more efficient way. (3 marks)

```
If TestScore >= 50 and Test Score < 60 then
        Msgbox("You got a C pass")
End if
If TestScore >= 60 and Test Score < 70 then
        Msgbox("You got a B pass")
End if
If TestScore >= 70 then
        Msgbox("You got a A pass")
End if
```

In the program above a test score is stored with a picture of each pupil. The images are stored as bitmap graphics. Explain how bitmap graphics are stored in a computer system.(1 mark)

Question 16

A factory uses a robot to scan items and measure their diameter. If they are the correct size they are put into boxes.

```
Line 1 DECLARE maxSize AS REAL INITIALLY 2.0
Line 2 DECLARE fullBox AS INTEGER INITIALLY 30
Line 3 DECLARE count AS INTEGER INITIALLY 0
Line 4 DECLARE itemSize AS REAL INITIALLY 0.0
Line 5 WHILE <there are more items to scan> DO
Line 6          RECEIVE itemSize FROM <scanner>
Line 7                  IF itemSize >= maxSize/2 AND itemSize <= maxSize THEN
Line 8                          <pick and pack scanned item>
Line 9                          SET count TO count + 1
Line 10                         IF count = fullBox THEN
Line 11                                 SEND "Box Full" TO TOUCHSCREEN
Line 12                                 SEND "Replace with Empty Box" TO
TOUCHSCREEN
Line 13                                 <pause until box replaced>
Line 14                                 SET count TO 0
Line 15                         END IF
Line 16                 END IF
Line 17 END WHILE
```

Explain how the program informs the user when a box is full. (3 marks)

What is line 14 used for?(1 mark)

The scanner on a second robot calculates the quality each item is and rates them 0-10

```
Line 1 DECLARE maxSize AS REAL INITIALLY 4.0
Line 2 DECLARE fullBox AS INTEGER INITIALLY 20
Line 3 DECLARE count AS INTEGER INITIALLY 0
Line 4 DECLARE quality AS REAL INITIALLY 0.0
Line 5 WHILE <there are more items to scan> DO
Line 6 RECEIVE itemSize FROM <scanner>
Line 7 IF itemSize >= maxSize/2 AND itemSize <=
maxSize THEN
Line 8 <pick and pack scanned item>
Line 9 SET count TO count + 1
Line 10 IF count = fullBox THEN
Line 11 SEND "Box Full" TO TOUCHSCREEN
Line 12 SEND "Replace with Empty Box" TO TOUCHSCREEN
Line 13 <pause until box replaced>
Line 14 SET count TO 0
Line 15 END IF
Line 16 END IF
Line 17 END WHILE
```

Describe how you could add to line 7 so that only items with a quality of 5 or over would be picked by the robot.(2 marks)

The program below was created by a pupil.

```
for counter in range(0,10):
print("Enter your percentage mark")
mark=int(input())
if mark >= 90:
print("You have achieved a grade A")
elif mark >= 70 and mark < 90:
print("You have achieved a grade B")
elif mark >= 50 and mark < 70:
print("You have achieved a grade C")
elif mark >= 40 and mark < 50:
print("You have achieved a grade D")
else:
print("You failed the test")
```

Describe two ways the pupil could make their program more readable.(2 marks)

Method 1:

Method 2:

Question 18

A program for a concert is created so that if a customer spends £70 or more on tickets they are eligible for an in store discount. Part of the program is below.(2 marks)

….
Line 30 IF total < 70 THEN
Line 31 SEND "Sorry you are not eligible for a discount" TO DISPLAY
Line 32 ELSE
Line 33 IF totalcost >= 150 THEN
Line 34 SEND "You are eligible for a 20% discount." TO DISPLAY
Line 35 ELSE
Line 36 SEND "You are eligible for a 10% discount." TO DISPLAY
Line 37 END IF
Line 38 END IF
….

State the output is the total cost is 75

State the output if the total cost is 150