Computing Homework

N5

Software Design & Development

Name:

Grade: / 16

Data Types and Input Validation 1

Answer the questions below in the spaces provided.

1. Glenmill High School is holding elections for House Captains.

   Below is part of a program design that takes in a valid number of votes for a pupil. The minimum number of votes is 0 and the maximum is 865.

```
Line 1:  REPEAT
Line 2:      RECEIVE votes FROM (INTEGER) KEYBOARD
Line 3:  UNTIL votes < 0 AND votes <= 865
```

(a) The above program design is an example of *iteration* as instructions are repeated.

Why is a *conditional loop* being used here rather than a fixed loop?

_____ (1)

(b) There is an error in the logic of the program design. Find and describe the error.

Line number	**Description**
_____	_____

(2)

(c) The design could be improved by adding an error message if the votes entered is out of range.

Use *pseudocode* or a programming language of your choice to show how this extra feature could be implemented.

(3)

2. Pupils move to the interview stage of the process if they receive more than 500 votes. The following program design decides if the pupil will be interviewed.

```
Line 1   SET interview TO false
Line 2   IF votes > 500 THEN
Line 3       SET interview TO true
Line 4       SEND ["Proceed to interview stage"] TO DISPLAY
Line 5   END IF
```

(a) (i) This program design features a *boolean variable.*

Describe a *boolean variable*.

_____ (1)

(ii) State the variable in the above design that is a *boolean variable*.

_____ (1)

(b) (i) The *data type* for the votes variable could be an *integer* or a *real* number.

State the most suitable data type for this program and justify your answer.

_____ (1)

(ii) What *data structure* would be required to store a list of votes i.e. the votes for each pupil in the running for House Captain?

_____ (1)

(c) During the process the interviewers award points for each pupils' performance. The points can range from 0 to 6.

Use pseudocode or a programming language of your choice to input and validate points between 0 and 6. An error message should be displayed if the points are out of range.

(6)

Total (16)