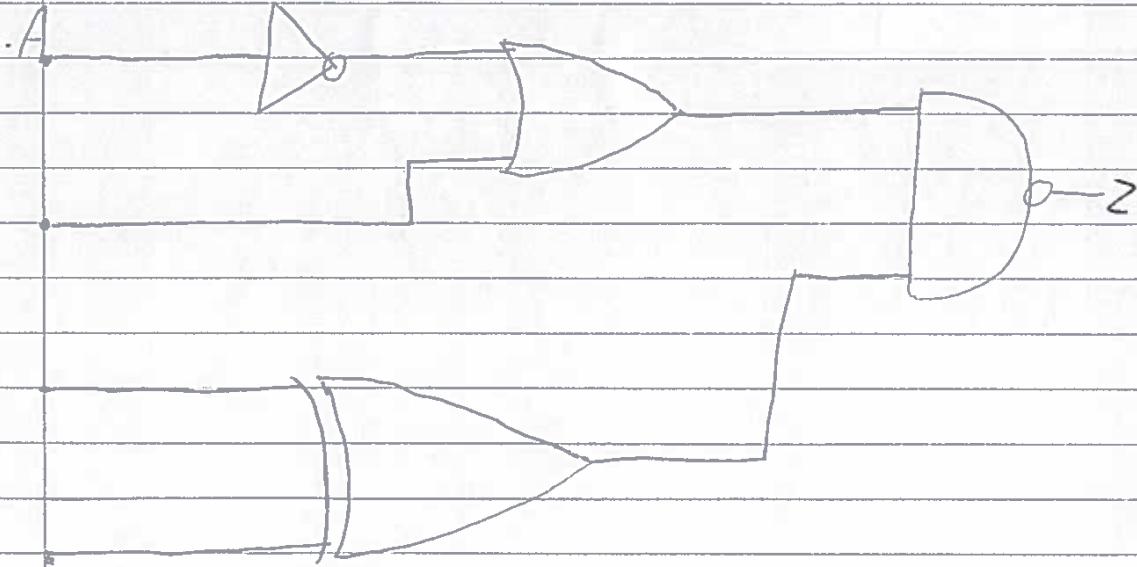
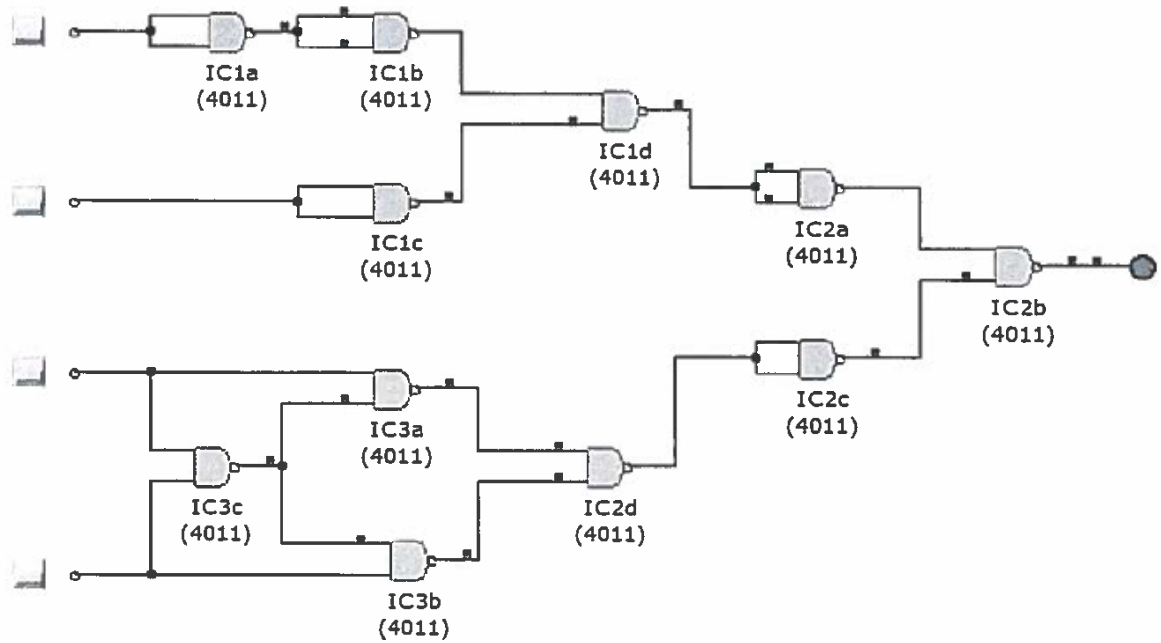


**Candidate 2 evidence***Assignment Task 1a*

$$Z = (\bar{A} + B) \cdot (C \oplus D)$$



## Assignment Task 1b



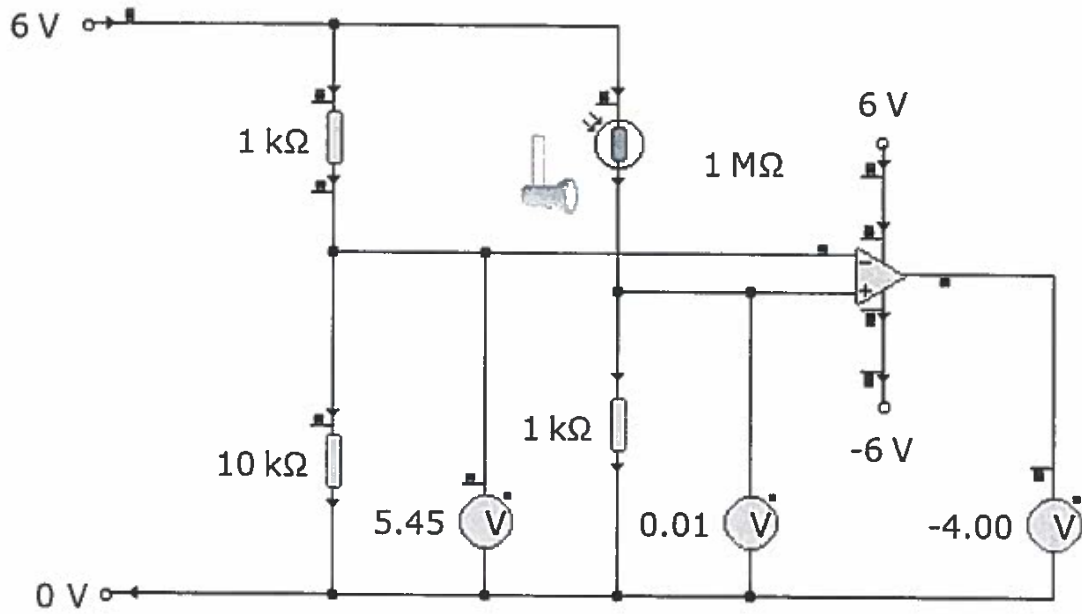
**Assignment Task 1c**

A	B	C	D	Expected results	Actual results
0	0	0	0	0	1
0	0	0	1	1	1
0	0	1	0	1	1
0	0	1	1	0	1
0	1	0	0	0	1
0	1	0	1	1	1
0	1	1	0	1	1
0	1	1	1	0	1
1	0	0	0	0	0
1	0	0	1	0	1
1	0	1	0	0	1
1	0	1	1	0	0
1	1	0	0	0	1
1	1	0	1	1	1
1	1	1	0	1	1
1	1	1	1	0	1

## Assignment task 1a

The expected results and the actual results differ in worksheet 1c because the circuit used when getting the expected results had a fault / different gate.

## Assignment Task 2a



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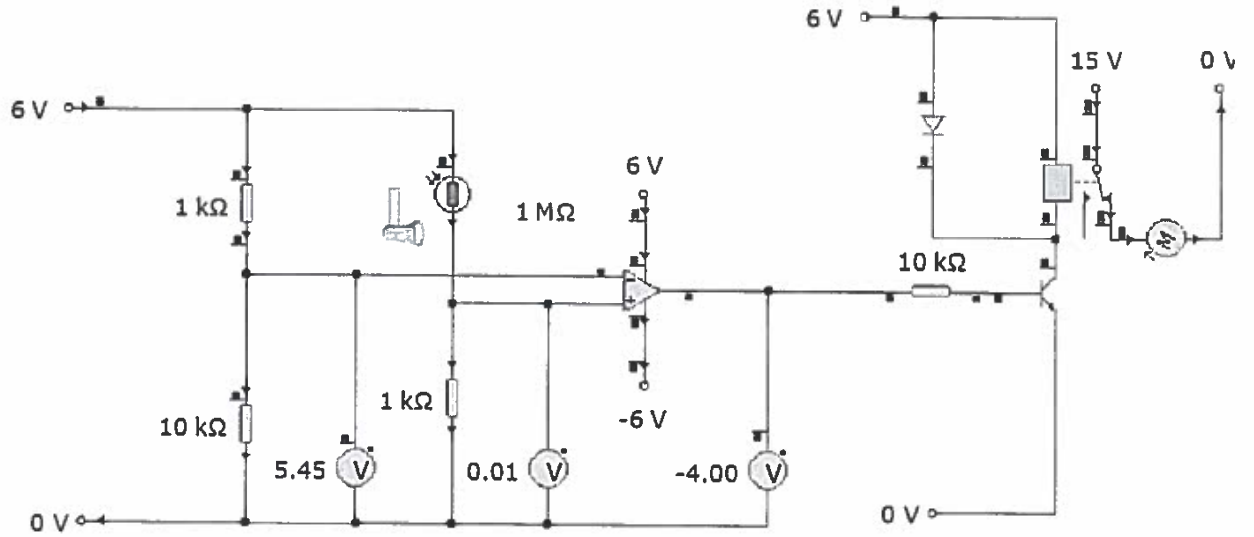
**Worksheet 2b**

Complete the testing table shown below.

Planned test	Expected result	Actual result	Amendments made
Reduce the light level to the minimum setting.	Op amp output saturates positive.	Op Amp output Saturates <del>Positive</del> Negative	<del>No amendments needed</del> No amendments needed
Alter the light level until op amp changes state.	Op amp output changes state at 3V.	Op amp output Changes state at 3V	No Amendments needed.

(4 marks)

# Assignment Task 2c



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**Worksheet 2d**

Complete the testing table shown below.

Planned test	Expected result	Actual result	Amendments made
Reduce the light level to minimum.	Motor turns.	Motor turns	NO Amendments made
Alter the value of both the LDR and the fixed resistor to 6k $\Omega$ .	The motor turns on under different lighting conditions.	Motor always stays on	No Solution found

(3 marks)

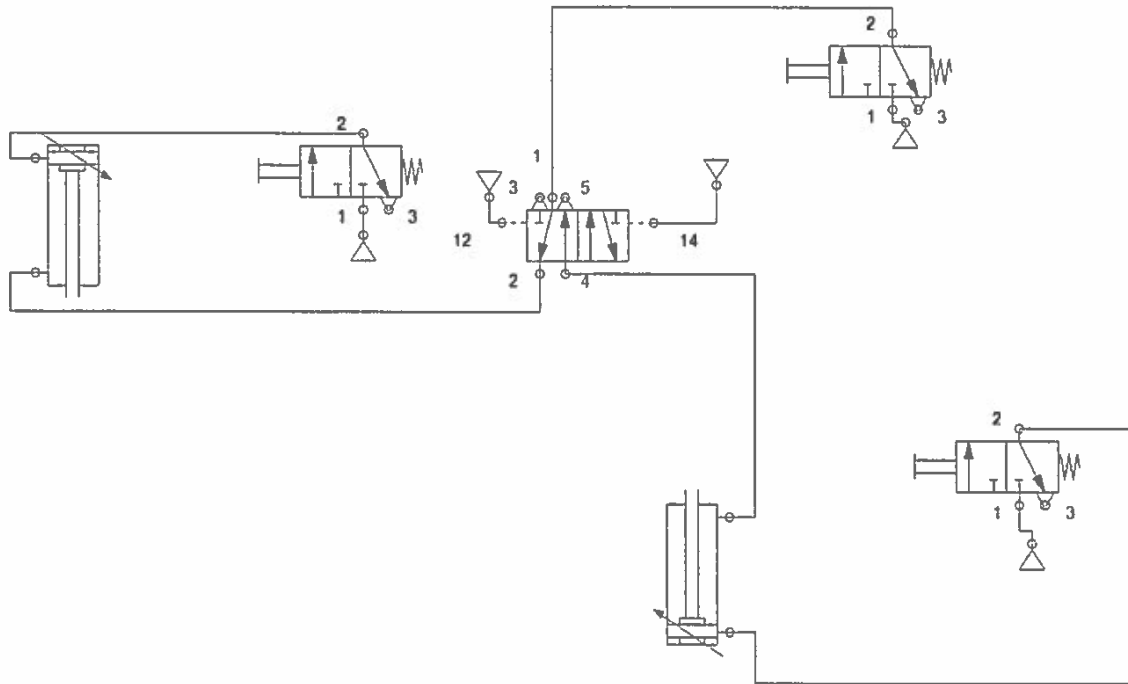


## Assignment task 2e

The circuit meets the first of the specification points, when the light level is at its lowest setting (e.g. when darkness is sensed) the motor is on.

The second specification point is not met,

### Assignment Task 3a



### Assignment Task 3b

$$H_A = P_1 * \cos(63) = 52.60 * 0.4540 = 23.88 \text{ (kN)}$$

2. Calculate reaction of roller support at the point B:

$$R_B = (q_1 * 19.3 * (19.3/2) + P_1 * \sin(63) * 6.2 + P_2 * 14.9) / 16.5 = (3.8 * 19.3 * (19.3/2) + 52.6 * 0.89106.2 + 78.4 * 14.9) / 16.5 = 131.30 \text{ (kN)}$$

3. Calculate reaction of pin support at the point A:

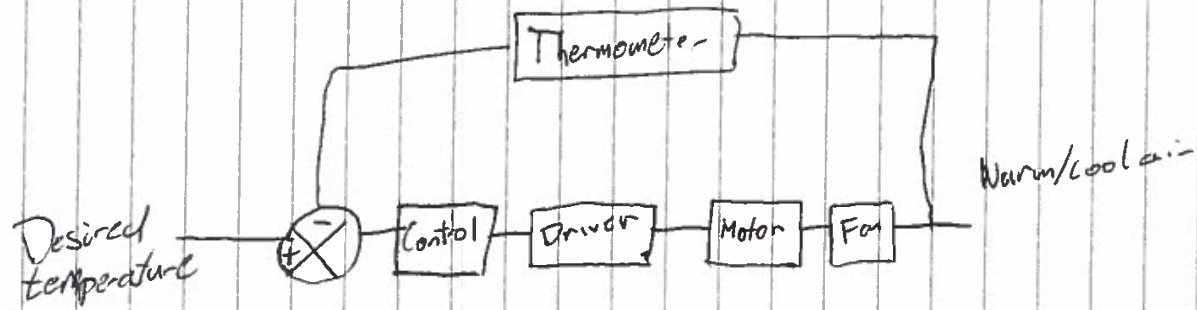
$$R_A = (q_1 * 19.3 * (16.5 - 19.3/2) + P_1 * \sin(63) * 10.3 + P_2 * 1.6) / 16.5 = (3.8 * 19.3 * (16.5 - 19.3/2) + 52.6 * \sin(63) * 10.3 + 78.4 * 1.6) / 16.5 = 67.31 \text{ (kN)}$$

$$R_a = 67.31 \text{ kN}$$

$$R_b = 131.30 \text{ kN}$$

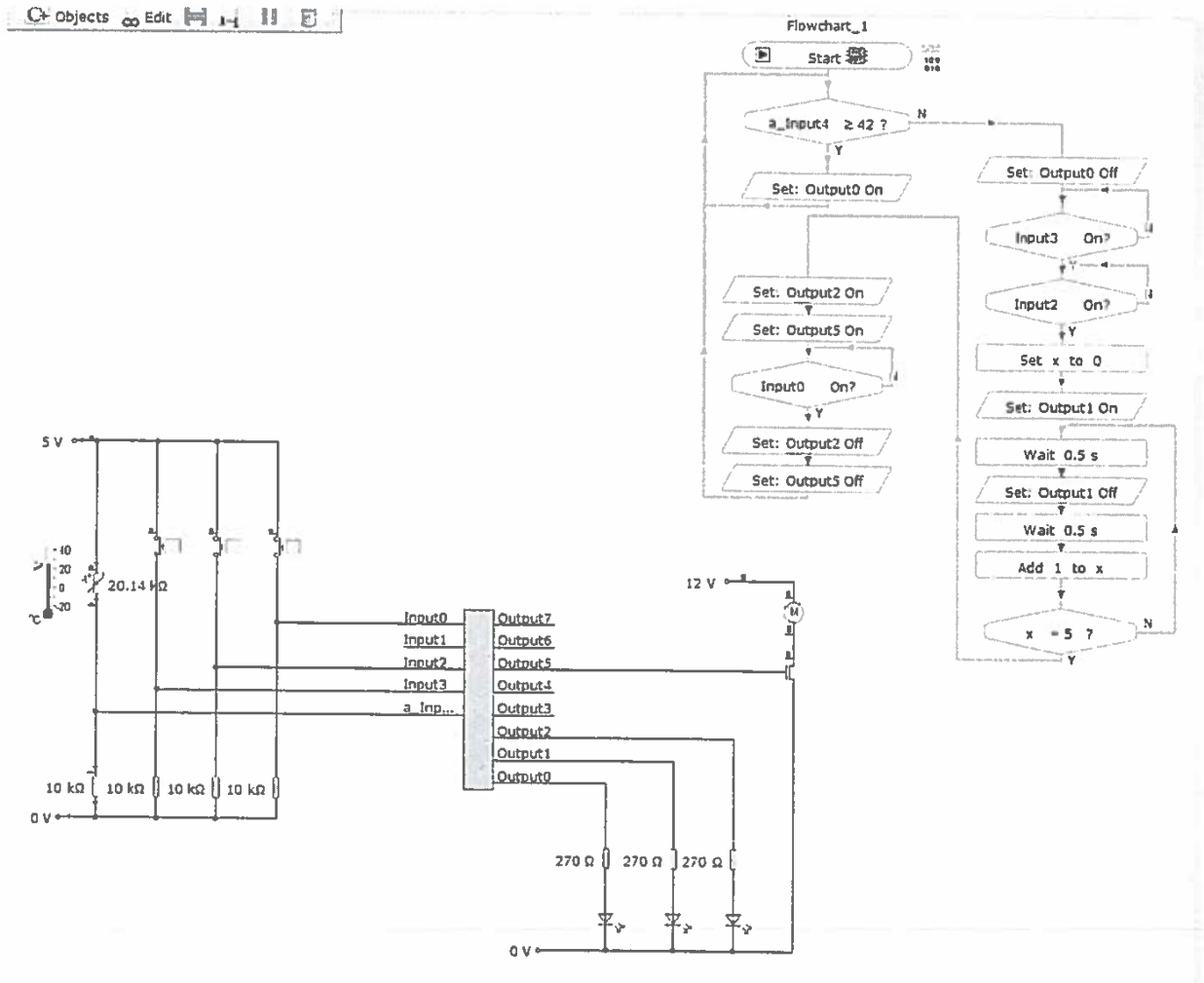
$$H_a = 23.88 \text{ kN}$$

$$H_b = 0 \text{ kN}$$





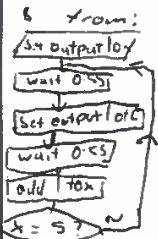
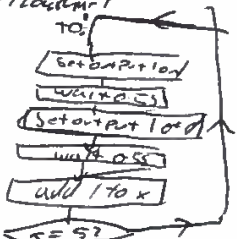
Assignment task 4

# Assignment Task 5a



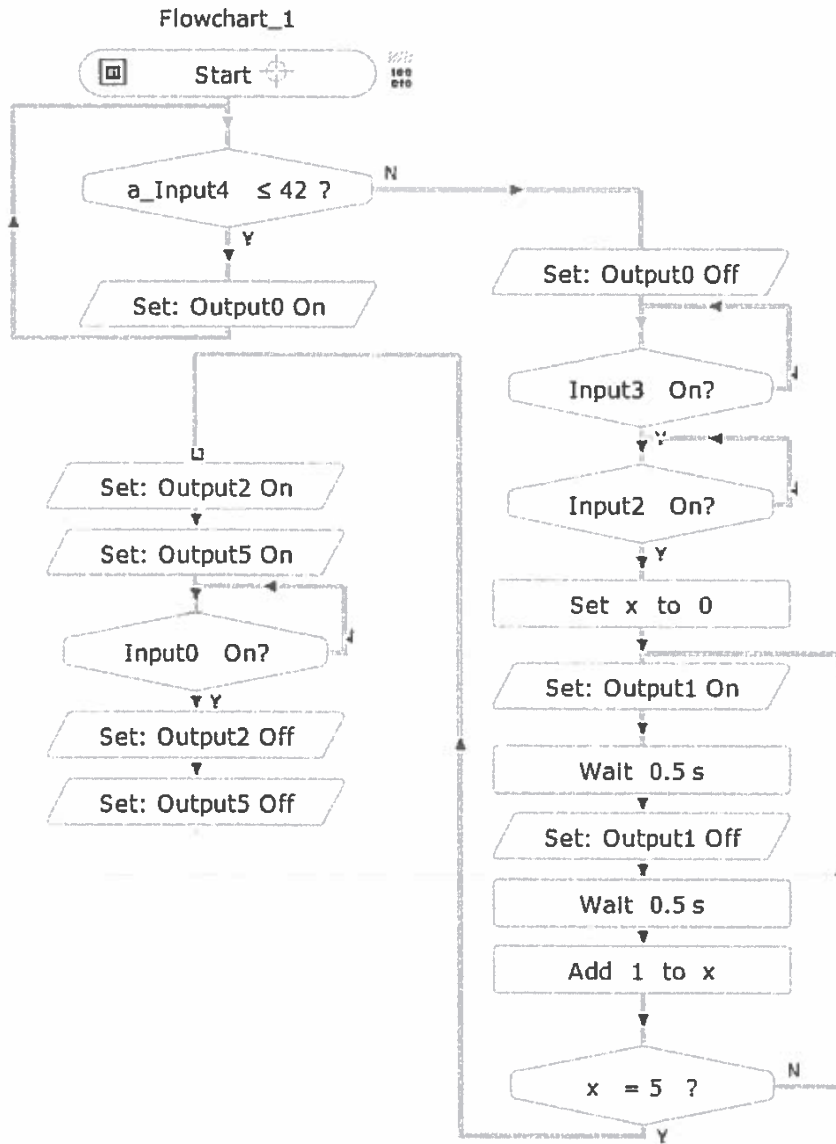
**Worksheet 5b**

Complete the testing table shown below.

Planned test	Expected result	Actual result	Amendments made
Adjust the thermistor temperature to its lowest value.	The 'temperature warning' indicator should be on.	The Temperature warning indicator does not turn on and the flowchart moves on.	Changed the flowchart from:  to: 
Adjust the thermistor temperature to its highest value.	The 'temperature warning' indicator should switch off – the flowchart should progress to the next decision.	The temperature warning indicator switches off and the flowchart moves on	No Amendments made
Press the 'harness safety check complete' switch and the 'operator switch' in sequence.	The 'harness safety check complete' indicator should flash five times.	Harness Safety check complete indicator only flashes one time	Changed to flowchart  

(5 marks)

# Assignment Task 5c



## Assignment Task 51

- i) The amended solution meets the first specification point, if the temperature drops below the set level, the temp. warning indicator will turn on. This did not work during testing but worked after the flowchart was amended to 'A. Input 4  $\leftarrow$  VIZ N
- ii) The second specification point has been met, the flowchart will not move on until the temperature is safe and both the 'harness safety check complete' switch and the operator switch has been pressed.  
The 'harness check complete' indicator will flash 5 times after the 'harness safety check complete' switch has been pressed. This did not originally work, but worked after amending the flowchart.
- iii) ~~The~~ The temperature warning indicator will turn on if the temperature drops below a set level before the ride starts however if the temperature drops below the set level whilst the ride is in progress, the indicator will not turn on