

Name	Score

Question 1:

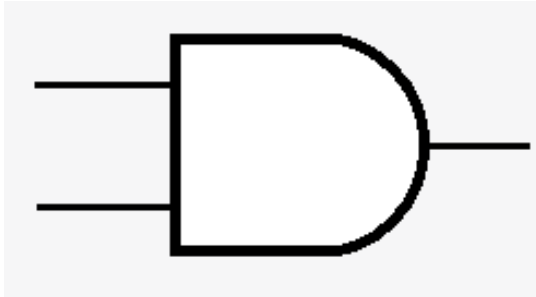


Figure 1

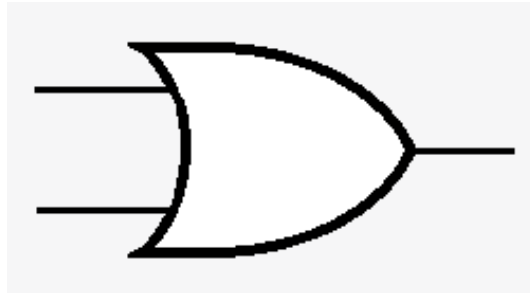


Figure 2

a) What is the logic gate pictured in *figure 1* called? (1 mark)

b) Can you describe how the logic gate in *figure 1* functions. (2 mark)

c) Can you fill in the truth table for the logic gate pictured in *figure 2* (2 marks)

Question 2:

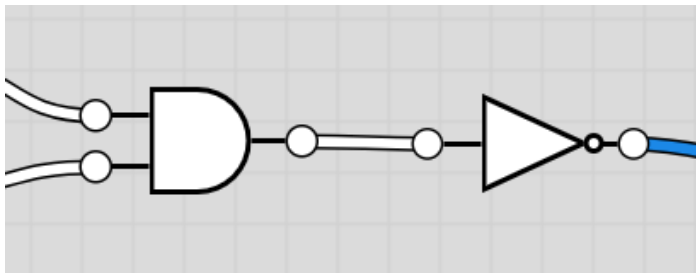


Figure 3

- a) Can you label the inputs and outputs for both gates in *figure 3*. (1 mark)
- b) Can you complete the below truth table for the circuit in *figure 3*: (2 marks)

- c) Which single logic gate performs the same function as the combination of the AND gate followed by the NOT gate? (1 mark)

- d) A logic circuit has the three inputs (A, B, C) and 1 output (Q). The output has the definition: **Q = (A AND B) OR (NOT C)**

Draw the logic circuit that fulfils this definition: (3 marks)

Question 3:

Describe a real-world example where an OR gate might be used in an engineering system. Explain the reasoning for using that gate. (5 marks)

Question 4:

a) Explain the difference between an open-loop and a closed-loop control system. (4 marks)

b) Give an example of an open-loop control system (6 marks)

Question 5:

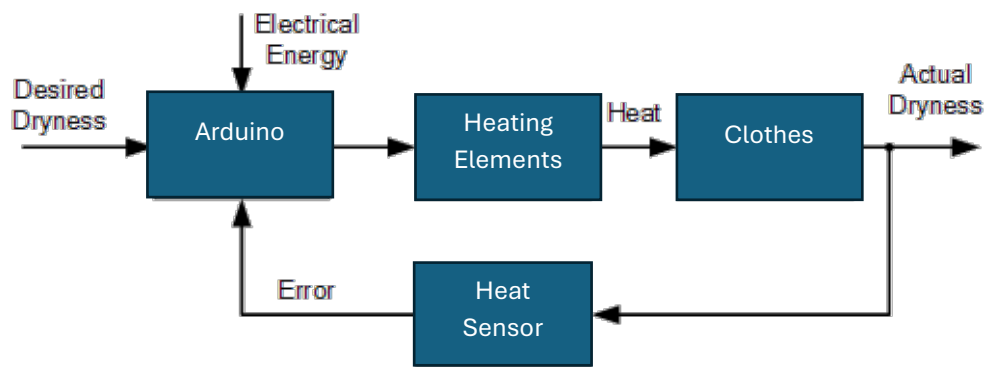


Figure 4

a) Is the system in figure 4 an open or closed loop control system? (1 mark)

b) For the system in figure 4 fill in this table (2 marks)

Input	
Process	
Output	
Feedback	
Controller	

c) What are the advantages of an open vs closed loop system in an industrial setting? (5 marks)
