# In-semester Test 1 – Practice

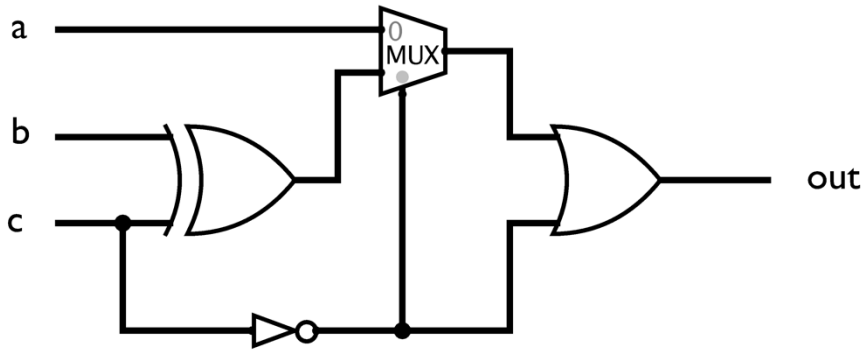
- You will be provided with stub .hdl for each question.
- Do not change the names of the input or output pins. Only write code in the PARTS: area of the .hdl files
- Note that the practice test contains the solutions and test scripts
- During the real test you will not have access to the Internet, your handbook or previous files etc. You will be provided with the API for each of the gates.

## Instructions

- Download the test files from Minerva
- Extract the .zip
- The only files you need to modify are **q1.hdl**, **q2.hdl**, **q3.hdl**

## Question 1

Implement the following circuit in *q1.hdl*.




*8 marks*

# Question 2

Design a circuit that implements the following truth table in *q2.hdl*

| a | b | c | out |
|---|---|---|---|
| 0 | 0 | 0 | 1 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 1 | 1 | 0 |

*8 marks*

# Question 3

In *q3.hdl* implement a pattern detector. It takes in an 8-bit input. If the following pattern occurs in the bits, the output is 1. If the pattern does not occur, the output is 0. 'x' represents a don't care

| x | x | **1** | **0** | **0** | **1** | x | x |
|---|---|---|---|---|---|---|---|

For example, if the input was

| 1 | 1 | **1** | **0** | **0** | **1** | 0 | 0 |
|---|---|---|---|---|---|---|---|

then the output would be 1.

If the input was

| 1 | 1 | **0** | **0** | **0** | **1** | 0 | 0 |
|---|---|---|---|---|---|---|---|

then the output would be 0.

*8 marks*