LAB 3

Q1

A. How many memory location has this RAM — justify your answer?
256 words in the memory, each with eight bits (or one byte).

B. What is the bit width of each memory location — justify your answer?
This requires a 7-bit address and an 8-bit bidirectional data bus.

Q2

A. What is the purpose of the M2 (Output Enable) input?
The purpose of M2 is write, it is used for upcoming signals
The two chip select (CS) control inputs are for enabling the chip only when the microprocessor selects it, while the read and write inputs describe the memory operation.

B. What is the purpose of the C1 (C3 on some versions) input on the RAM, is there any clue to what its function is?
the purpose of the Chip Enable (C1 or C3) input on a RAM chip is to enable or disable the chip, allowing multiple RAM chips to share the same address and data lines and also to save power when the chip is not actively being used.

Q3

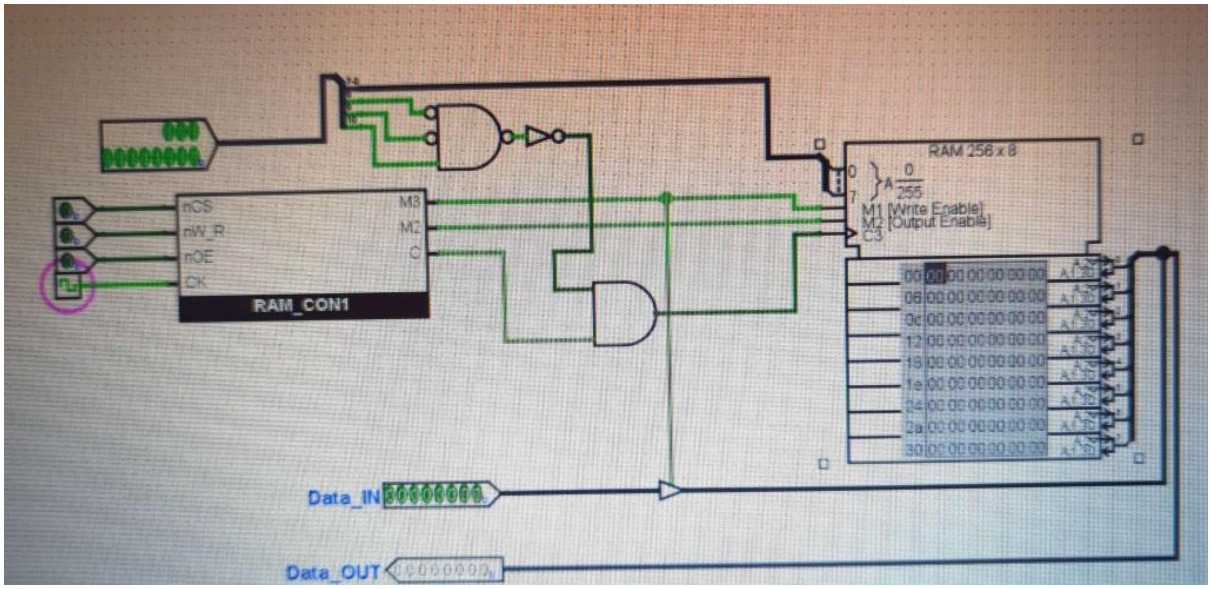
A. If the read enable is set to high, you can set the write enable to low. It effectively prevents two inputs being high.

B. Because it is not clocked, it cannot store data, which is why the data is not immediately stored

C. So, in essence, the bus is bidirectional. As a result, data is coming in and out at the same time, resulting in an error.

D. To solve the problems that are causing the errors, simply add a controller buffer to the circuit. Controlled buffers are useful when you have a wire (often referred to as a bus) whose value should match the output of one or more components.

Q4


RAM 256 x 8
0
7
A
0
255
M1 [Write Enable]
M2 [Output Enable]
C3
nCS
nW_R
nOE
CK
M3
M2
C
RAM_CON1
Data_IN
Data_OUT