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**CQUPT EE310 2017 Fall Quiz 6b**

**(20min, 30pts)**

1. (2pts) A memory block has 30-bit address bus, what is the maximum number of memory locations does this block support?

Maximum memory locations

1. (4pts) What are multiport memories? What is the benefit to have a dual-port RAM over a single-port RAM?

Memories with more than 1 data/address buts and control lines.

Can perform read and write at the same time

1. (4pts) What is the full name of SRAM? What is the difference between asynchronous and synchronous SRAM?

Static random access memory

Asynchronous SRAM is combinational and there is no clock signal

Data in synchronous SRAM can only be accessed at clock edge

1. (4pts) Determine the following memory type: volatile or nonvolatile:

a). ROM b). SRAM c). DRAM d). Flash RAM

volatile: b) and c)

nonvolatile: a) and d)

1. (6pts) Explain how you can configure the following DRAM cell to read a logic ‘1’ stored on the capacitor.

DRAM-storage-cell Set bit line to intermediate voltage (between 0 and 1), and then set word line to high to turn on the MOSFET.

1. (10pts) Using two of the 8-bit memory block given below, expand the input/output data size to 16 bits. Show your connections and mark the lower and higher byte clearly.

