

**CSE315: Microprocessors, Microcontrollers, and Embedded Systems**

**Class Test – 2**

Student #: 1705045

**Time: 20 minutes**

Mark: 20

[Instructions: 1) Type your answer in the place after “**Answer:**” below. 2) Then, make a pdf file of it (your answer) and submit that (pdf) in Moodle \*in time\*. 3) Check and confirm at your own that your submitted file is okay and not corrupted. Grading will be made based on what will be available in Moodle.]

**Question:**

A system designer is given a task to interface several memory units (DRAM, EPROM, and flash) with an advanced microprocessor. Here, all the memory units need to be organized in banks.

To develop such a design, the system designer has adopted the following –

1. He uses decoders to activate different banks through generating their (i.e., the banks’) “Select” control signals by the decoders,
2. He produces separate “Write” signals for the banks, and
3. He produces separate “Read” signals for the banks.

Now, you need to judge the above mentioned points from the following perspectives with all necessary elaborations.

1. Does the design have any flaw from the perspective of accuracy? If so, clearly point that (those) out.
2. Does the design have any flaw from the perspective of efficiency? If so, clearly point that (those) out.

In case you think that there is no flaw (in either or both the perspectives) in the design, you need to explicitly mention that (those). Unless you explicitly mention anything, your answer will be treated as a blank answer in the corresponding part.

**Answer:**

There is no problem with accuracy.

His design is not efficient in some sense.

1. It is not necessary to produce separate “read” signals for the banks. We can read the whole data, and later extract from that. In this case, extraction will be done inside this design. It is not wrong, but it is not efficient.
2. From point 1 of the design description, it is not clear whether he used decoder for selecting a single separate bank of a separate address space, or he used decoder for separate address space only (and all banks of same address space of a memory unit have similar select). If later is true, point 2 and 3 are quite unnecessary, (as their job is done by that decoder of point 1).