1. (50 points)
(a) (20 points) Design microcomputer system with the 68000 microprocessor and two 8-bit peripherals PER1 and PER2 using 128-byte address windows starting at address $01 C000. You may use AND, OR, NOT, NAND, NOR, XOR logic gates, LS138 (3 to 8 decoder), LS148 (priority encoder) or any other standard digital circuits.
(b) (30 points) Design the logic interface necessary to implement vectored interrupts: PER1 is connected to the Level 4 and PER2 to the level 5 interrupt request. Describe how the 68000 responds to an external interrupt request using standard vector interrupt acknowledgment method. How does a peripheral device respond to an IACK cycle on the bus? What are uninitialized interrupts? Illustrate relevant internals of the peripheral device.

2. (20 points) Describe bus arbitration sequence and draw a timing diagram of control signals for MC68000.

BR*

BG*

BGACK*

2. (30 points) Design a circuit to insert two wait-states per EPROM (EPROM* signal is active) access and one wait-state per RAM memory access (RAM1* or RAM2* signal is active). (Note state: in this case, one wait state is ONE CLOCK CYCLE long)