CMSC 311- Computer Organization

Fall 1995 - Assignment #5 (Solutions)

1) Represent the following floating-point numbers using a 16 bit normalized mantissa and 8 bit exponent:

a) 128.0

mantissa 0000 0000 0000 0000
exponent 0000 1000

b) 46.5

mantissa 0011 10100 0000 0000
exponent 0000 0110

c) 0.2

mantissa 0100 1100 1100 1100
exponent 1111 1110

d) 17.21875

mantissa 0000 1001 1100 0000
exponent 0010 0000

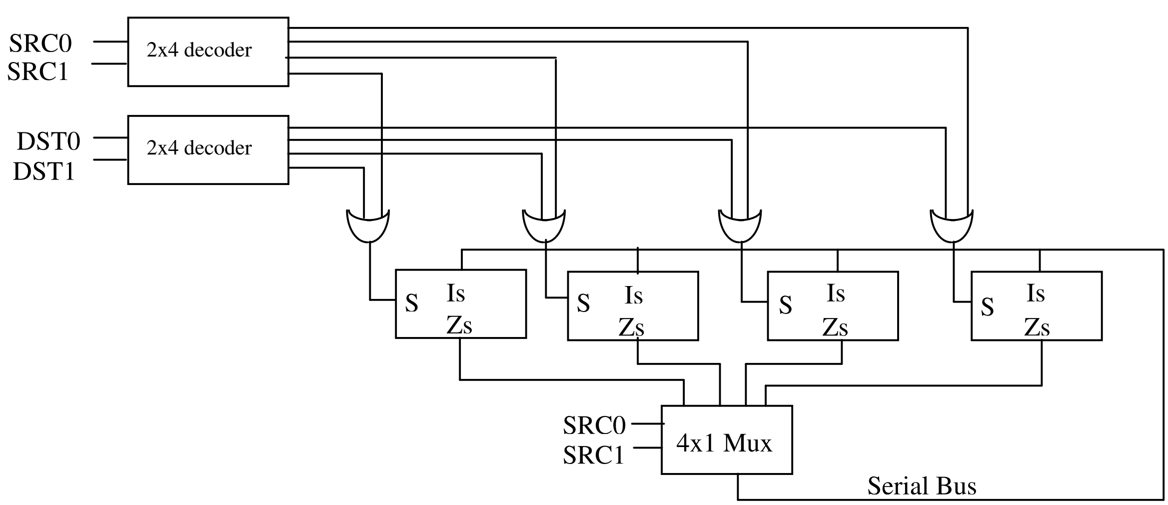
2) From Mano problem 4-3.

P: R1 ← R2
P'Q: R1 ← R3

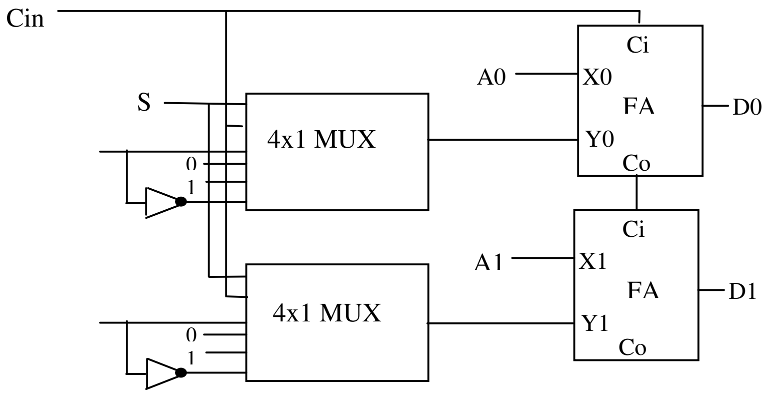
3) From Mano problem 4-6.

(a) 4 selection lines to select one of 16 registers
(b) 16 x 1 multiplexers
(c) 32 multiplexers, one for each bit of the register

4) Serial Bus



5) From Mano, problem 4-15



6) From Mano, problem 4-23.

(a) can not complement and increment the same register at the same time.
(b) cannot transfer two different values (R2 and R3) to the same register (R1) at the same time.
(c) cannot transfer a new value into a register (PC) and increment the original value by one at the same time.