

## COE 405, Term 062

### Design & Modeling of Digital Systems

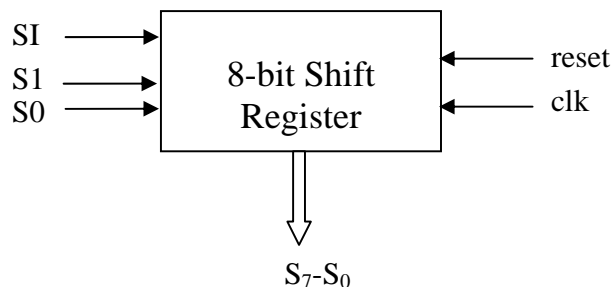
#### HW# 2

Due date: Monday, March 26, 2007

- Q.1.** It is required to design an **8-bit shift register**. The shift register should be able to shift or rotate either left or right based on the following table:

S1 S0	Operation
00	Shift left
01	Shift right
10	Rotate left
11	Rotate right

The reset is a synchronous reset and the shift register is rising-edge triggered. Assume that the shifted bit is based on the input SI. The interface description of the 8-bit shifter is shown below.



- (i) Describe an Entity **Shifter8** for the 8-bit shift register.
  - (ii) Model a behavioral Architecture **Behave** for this 8-bit shift register. Verify its correctness by simulation.
  - (iii) Model a structural Architecture **Struct** for this 8-bit shift register. Make your model generic using GENERATE statement to instantiate the required components such that your design can be extended into a shift register of any size by changing just a size parameter. Use configuration statement to configure the bounding of used components to entities. Verify the correctness of your model by simulation.
- Q.2. Problem 4.15.**