**Name:**                                                                 **Id#**

## COE 405, Term 062

## Design & Modeling of Digital Systems

## Quiz# 2

Date: Monday, March 26, 2007

**Q.1.** Given the following signal assignments, show all transactions placed on each signal. At each event, show transactions that are appended, overwritten, and expired including those occurring at delta time. Show resulting waveforms on each signal.

Architecture dataflow of signals IS
    Signal A, B, C, D: Bit := '0';
Begin
 A <= '1' after 10ns, '0' after 13ns, '1' after 17 ns, '0' after 25 ns, '1' after 26 ns;
 B <= transport A after 5ns;
 C <= A after 5 ns;
 D <= Reject 2 ns Inertial A after 5 ns;
End dataflow;

| | Time | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Current Value | | | | | | | | | | | | | | |
| | Projected Waveform | | | | | | | | | | | | | | |
| B | Current Value | | | | | | | | | | | | | | |
| | Projected Waveform | | | | | | | | | | | | | | |
| C | Current Value | | | | | | | | | | | | | | |
| | Projected Waveform | | | | | | | | | | | | | | |
| D | Current Value | | | | | | | | | | | | | | |
| | Projected Waveform | | | | | | | | | | | | | | |

**Q.2.** You are required to model an N-bit 2x1 MUX. The MUX entity declaration is given below:

```
Entity MUXN2x1 is
        Generic(N : Natural :=8);
        PORT (A, B : IN Bit_Vector(N-1 Downto 0);
            S: IN Bit;
            C: OUT Bit_Vector(N-1 Downto 0)
            );
End;
```

**(i)** Model a single-bit 2x1 MUX using behavioral model.

**(ii)** Using the model developed in (i) for the single-bit 2x1 MUX, develop a structural model for the N-bit 2x1 MUX using **generate** statement.