Assignment 1

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July 1, 2025

Question 1

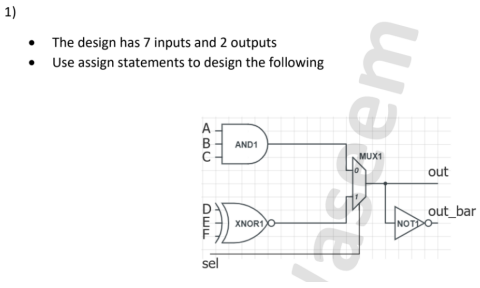

Figure 1: Question

Solution:

```
1  module Q1(A, B, C, D, E, F, sel, out, out_bar);
2
3      input A, B, C, D, E, F, sel;
4      output out, out_bar;
5      wire X1, X2;
6
7      and(X1, A, B, C);
8      xnor(X2, D, E, F);
9      assign out = (sel == 1)? X2 : X1;
10     assign out_bar = ~out;
11
12 endmodule
```

Figure 2: Q1 Code

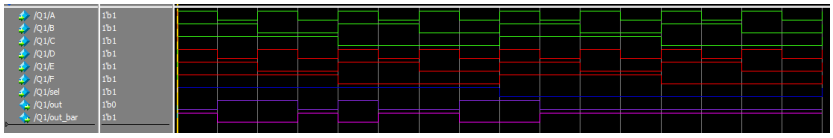

Figure 3: Q1 Waveform

Question 2

- The design has 5 inputs and 2 outputs
  - Inputs
    - i. D -> width = 3
    - ii. A, B, C, Sel -> width = 1
  - Outputs
    - i. Out, out_bar -> width = 1
- Use Behavioral coding style to implement the following

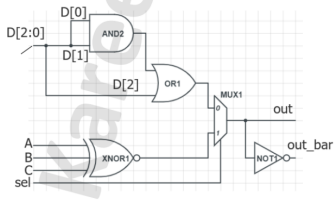

Figure 4: Question

Solution:

```
1  module Q2(D, A, B, C, sel, out, out_bar);
2
3      input [2:0] D;
4      input A, B, C, sel;
5      output out, out_bar;
6      wire AND2, OR1, XNOR1;
7
8      and(AND2, D[0], D[1]);
9      or(OR1, AND2, D[2]);
10     xnor(XNOR1, A, B, C);
11
12     assign out = (sel == 1) ? XNOR1 : OR1;
13     assign out_bar = ~out_bar;
14
15 endmodule
```

Figure 5: Q2 Code

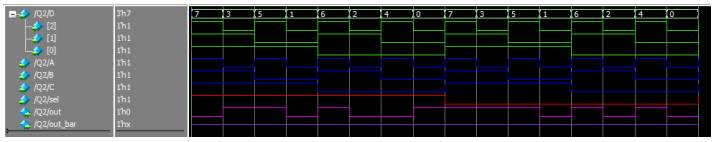

Figure 6: Q2 Waveform