DSD LAB

Week-4 Assignment Submission

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Batch B1

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Q1)

Source Code:

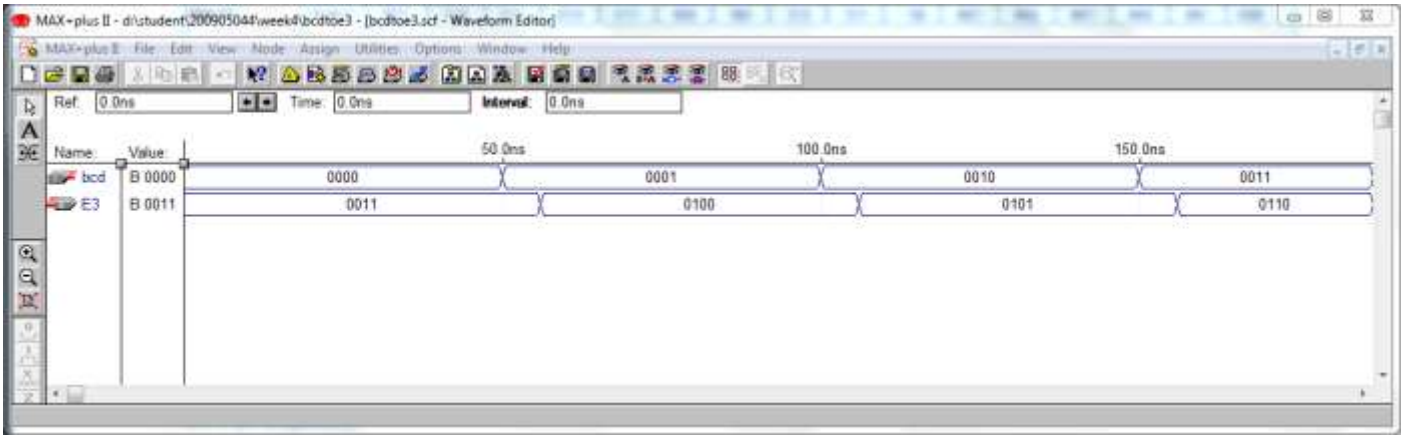
```
module bcdtoe3(bcd, E3);

input [3:0] bcd;

output [3:0] E3;

reg [3:0] E3;

wire e3, e2, e1, e0;

mux8to1 m3({1'b0, 1'b0, 1'b0, 1'b1, 1'b1, bcd[0], 1'b0, 1'b0},bcd[3:1], e3);

mux8to1 m2({1'b0, 1'b0, 1'b0, bcd[0], 1'b0, ~bcd[0], 1'b1, bcd[0]},bcd[3:1], e2);

mux8to1 m1({1'b0, 1'b0, 1'b0, ~bcd[0], bcd[0], ~bcd[0], bcd[0], ~bcd[0]},bcd[3:1],
e1);

assign e0 = ~bcd[0];

always @(bcd)

begin

E3[0] = e0;

E3[1] = e1;

E3[2] = e2;
```

```
E3[3] = e3;
end
endmodule


module mux8to1(W, S, out);
input [7:0]W;
input [2:0]S;
wire [7:0]W;
wire [2:0]S;
output out;
reg out;
always @(W or S)
begin
case(S)
0: out = W[0];
1: out = W[1];
2: out = W[2];
3: out = W[3];
4: out = W[4];
5: out = W[5];
6: out = W[6];
7: out = W[7];
endcase
```

end

endmodule

Output Waveform:



Q2)

Source Code:

module decoder4to16(I, En, D);

input [3:0]I;

input En;

output [0:15]D;

wire [0:3]En_temp;

wire [0:15]Dout;

decoder2to4 d1(I[3:2], En, En_temp[0:3]);

decoder2to4 d2(I[1:0], En_temp[0], Dout[0:3]);

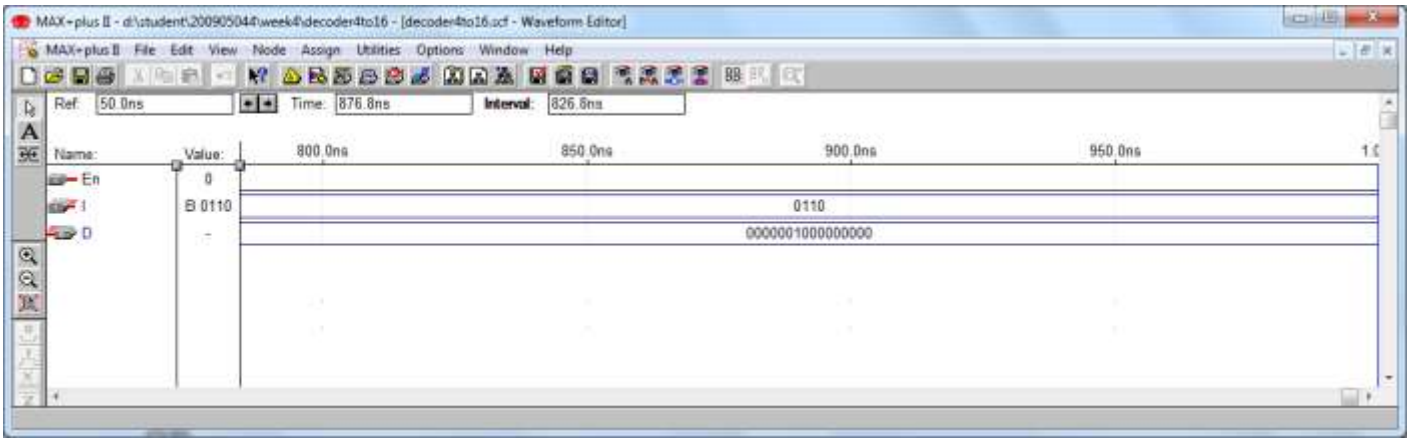
decoder2to4 d3(I[1:0], En_temp[1], Dout[4:7]);

decoder2to4 d4(I[1:0], En_temp[2], Dout[8:11]);

decoder2to4 d5(I[1:0], En_temp[3], Dout[12:15]);

```
assign D = ~Dout;
endmodule

module decoder2to4(I, En, D);
input [1:0] I;
input En;
output [0:3] D;
reg [0:3] D;
always @(I or En)
begin
D = 4'b1111;
if(En == 0)
case(I)
0: D = 4'b0111;
1: D = 4'b1011;
2: D = 4'b1101;
3: D = 4'b1110;
endcase
else
D = 4'b1111;
end
endmodule
```

Output Waveform :



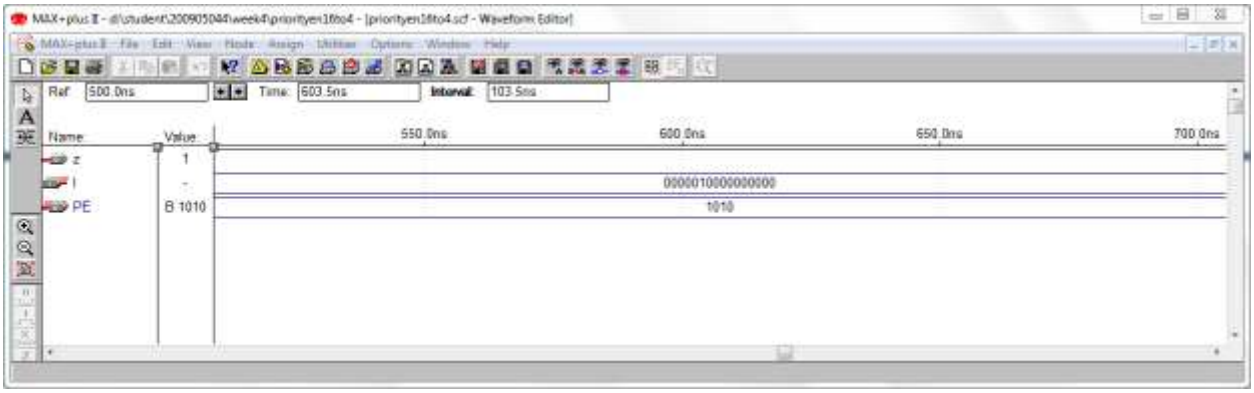
Q3)

Source Code:

```
module priorityen16to4(I, PE, z);

input [15:0] I;

output [3:0] PE;

reg [3:0] PE;

output z;

reg z;

integer i;

always @(I)

begin

z = 0;

if(I == 0)

PE = 0;

else
```

```
begin
for(i = 0; i<16; i = i+1)
begin
if(I[i] == 1)
PE = i;
end
z = 1;
end
end
endmodule
```

Output Waveform:



THANK YOU!