**BEHAVIOURAL MODELLING**

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**ROLL NUMBER: B200055CS**

1.

module MUX2X1\_BEHAVE(y\_out,in\_y,in\_y\_,in\_s);

output reg y\_out;

input in\_y, in\_y\_,in\_s;

always@(in\_y,in\_y\_,in\_s)

begin

y\_out=~(~(in\_y&~(in\_s&in\_s))&~(in\_y\_&in\_s));

end

endmodule

2.

module DEMUX\_BEHAVE(y\_out,y\_out\_1,in\_y\_,in\_selec);

output reg y\_out,y\_out\_1;

input in\_y\_;

input in\_selec;

always@(in\_y\_ or in\_selec)

begin

y\_out=~((~(in\_y\_&(~(in\_selec&in\_selec))))&(~(in\_y\_&(~(in\_selec&in\_selec)))));

y\_out\_1=~((~(in\_y\_&in\_selec))&(~(in\_y\_&in\_selec)));

end

endmodule

3.

module sixteenbit\_behave\_mux(y\_out\_,in\_y1,in\_y\_1,in\_selec);

output[15:0]y\_out\_;

input[15:0] in\_y1, in\_y\_1;

input in\_selec;

MUX2X1\_BEHAVE test\_1[15:0](.y\_out(y\_out\_),.in\_y(in\_y1),.in\_y\_(in\_y\_1),.in\_s(in\_selec));

endmodule

4.

module mux\_behave\_16bit\_4X1MUX(out\_y,inp\_1,inp\_2,inp\_3,inp\_4,selec\_1,selec\_2);

output out\_y;

input[15:0] inp\_1,inp\_2,inp\_3,inp\_4;

input selec\_1,selec\_2;

wire[15:0] t1,t2;

sixteenbit\_behave\_mux test\_1(.y\_out\_(t1),.in\_y1(inp\_1),.in\_y\_1(inp\_2),.in\_selec(selec\_1));

sixteenbit\_behave\_mux test\_2(.y\_out\_(t2),.in\_y1(inp\_3),.in\_y\_1(inp\_4),.in\_selec(selec\_1));

sixteenbit\_behave\_mux test\_3(.y\_out\_(out\_y),.in\_y1(t1),.in\_y\_1(t2),.in\_selec(selec\_2));

endmodule

5.

module mux\_behave\_8x1\_mux(out\_y\_,in\_1,in\_2,in\_3,in\_4,in\_5,in\_6,in\_7,in\_8,in\_selec1,in\_selec2,in\_selec3);

output[15:0] out\_y\_;

input[15:0]in\_1,in\_2,in\_3,in\_4,in\_5,in\_6,in\_7,in\_8;

input in\_selec1,in\_selec2,in\_selec3;

wire[15:0] t1\_in\_out,t2\_in\_out;

mux\_behave\_16bit\_4X1MUX test\_1(.out\_y(t1\_in\_out),.inp\_1(in\_1),.inp\_2(in\_2),.inp\_3(in\_3),.inp\_4(in\_4),.selec\_1(in\_selec1),.selec\_2(in\_selec2));

mux\_behave\_16bit\_4X1MUX test\_2(.out\_y(t2\_in\_out),.inp\_1(in\_5),.inp\_2(in\_6),.inp\_3(in\_7),.inp\_4(in\_8),.selec\_1(in\_selec1),.selec\_2(in\_selec2));

MUX2X1\_BEHAVE test\_3(.y\_out(out\_y\_),.in\_y(t1\_in\_out),.in\_y\_(t2\_in\_out),.in\_s(in\_selec3));

endmodule

6.

module DEMUX\_1X4\_BEHAVE(out\_y1,out\_y2,out\_y3,out\_y4,in\_1,in\_selec0,in\_selec1);

output out\_y1,out\_y2,out\_y3,out\_y4;

input in\_1,in\_selec0,in\_selec1;

wire t0,t1;

DEMUX\_BEHAVE MUX1(.y\_out(t0),.y\_out\_1(t1),.in\_y\_(in\_1),.in\_selec(in\_selec0));

DEMUX\_BEHAVE MUX2(.y\_out(out\_y1),.y\_out\_1(out\_y2),.in\_y\_(t0),.in\_selec(in\_selec1));

DEMUX\_BEHAVE MUX3(.y\_out(out\_y3),.y\_out\_1(out\_y4),.in\_y\_(t1),.in\_selec(in\_selec1));

endmodule

7.

module DEMUX\_1X8\_BEHAVE(out\_1,out\_2,out\_3,out\_4,out\_5,out\_6,out\_7,out\_8,in\_1,ins\_1,ins\_2,ins\_3);

output out\_1,out\_2,out\_3,out\_4,out\_5,out\_6,out\_7,out\_8;

input in\_1,ins\_1,ins\_2,ins\_3;

wire t0,t1,t2,t3,t4,t5;

DEMUX\_BEHAVE test\_1(.y\_out(t0),.y\_out\_1(t1),.in\_y\_(in\_1),.in\_selec(ins\_1));

DEMUX\_BEHAVE test\_2(.y\_out(t2),.y\_out\_1(t3),.in\_y\_(t0),.in\_selec(ins\_2));

DEMUX\_BEHAVE test\_3(.y\_out(t4),.y\_out\_1(t5),.in\_y\_(t1),.in\_selec(ins\_2));

DEMUX\_BEHAVE test\_4(.y\_out(out\_1),.y\_out\_1(out\_2),.in\_y\_(t2),.in\_selec(ins\_3));

DEMUX\_BEHAVE test\_5(.y\_out(out\_3),.y\_out\_1(out\_4),.in\_y\_(t3),.in\_selec(ins\_3));

DEMUX\_BEHAVE test\_6(.y\_out(out\_5),.y\_out\_1(out\_6),.in\_y\_(t4),.in\_selec(ins\_3));

DEMUX\_BEHAVE test\_7(.y\_out(out\_7),.y\_out\_1(out\_8),.in\_y\_(t5),.in\_selec(ins\_3));

endmodule