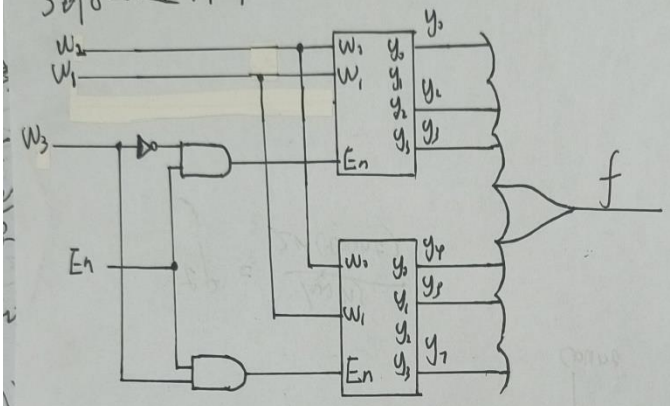
梁相　2023370018　计算机10012209 班

4.1

解：3到8二进制译码器的 $y_0, y_2, y_3, y_4, y_5, y_7$ 恰好为真时，w_1, w_2, w_3 符合要求



4.5 解：$f(w_1, w_2, w_3) = \sum m(0, 2, 3, 6)$

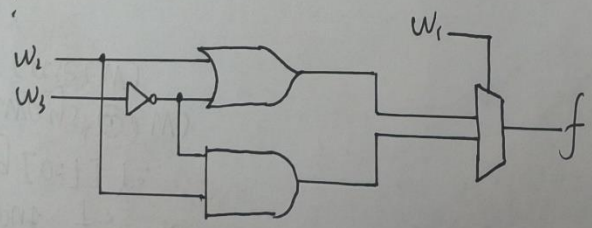
$= \bar{w}_1\bar{w}_2\bar{w}_3 + \bar{w}_1 w_2 w_3 + \bar{w}_1 w_2 \bar{w}_3 + w_1 w_2 \bar{w}_3$

$= \bar{w}_1 f_{\bar{w}_1} + w_1 f_{w_1}$

$= \bar{w}_1(\bar{w}_2\bar{w}_3 + w_2\bar{w}_3 + w_2 w_3) + w_1 w_2 \bar{w}_3$

$= \bar{w}_1(\bar{w}_3 + w_2) + w_1 w_2 \bar{w}_3$

电路：

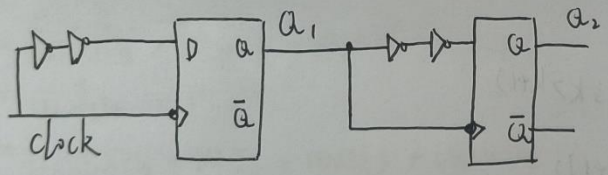


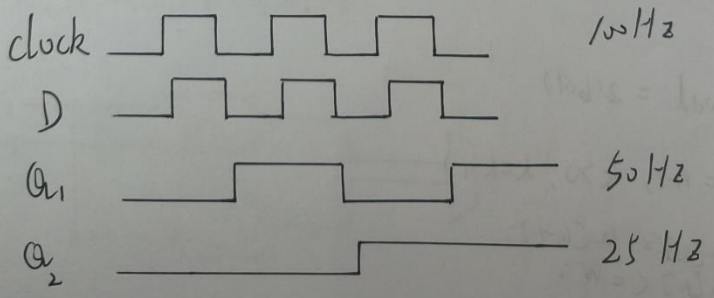
5.3 解：与书同理

verilog代码：

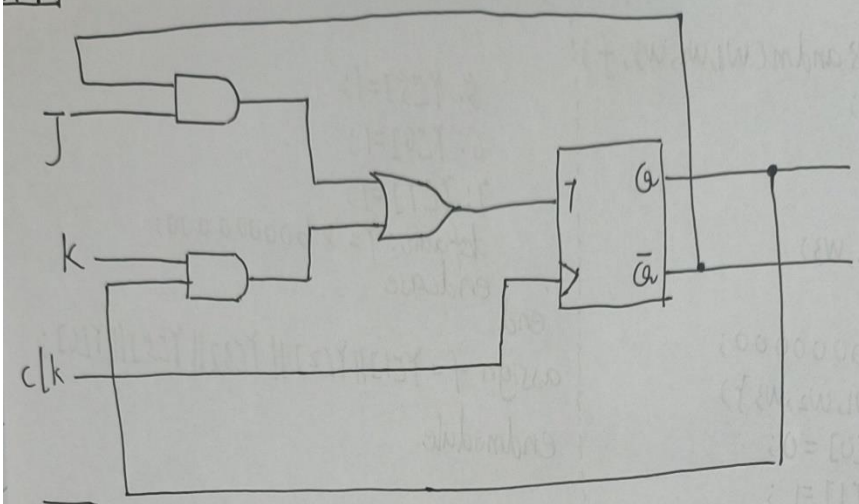
```
module dec3to8andm(w1,w2,w3,f);
  input w1,w2,w3;
  output f;
  reg [0:7] Y;
  always@(w1,w2,w3)
  began
      Y=8'b00000000;
      case({w1,w2,w3})
          0: Y[0]=1;
          1: Y[1]=1;
          2: Y[2]=1;
          3: Y[3]=1;
          4: Y[4]=1;
          5: Y[5]=1;
          6: Y[6]=1;
          7: Y[7]=1;
          default: Y=8'b00000000;
          endcase
  end
  assign f=Y[1]||Y[2]||Y[3]||Y[5]||Y[6];
  endmodule
```

5.4





5.7

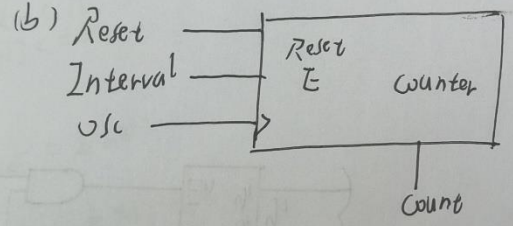


5.13

```
module shiftn (D, Q, F, Load, clk)
    input  clk;
    input  [n-1:0] D; [n-1:0]Q ; [1:0]Load;
    output reg [n-1:0] Q
    integer k;
    always @ (posedge , clk)
    begin
        if (Load = 2'b00)
        begin for (k=0; k<n-1; k>k+1)
            begin
                Q[k] <= Q[k+1];
                Q [n-1] <= W;
            end
        end
        else if ( Load = 2'b01)
        begin
            for [k = n-1; k>0; k=k-1)
            begin Q [k]<= Q [k-1];
                Q [n] <= W;
            end
        else if ( Load = 2'b10)
            Q <=1);
    end
endmodule
```

5.24 (a) $f = \frac{1}{2n \times t_p}$

(b)



$t_p = \frac{1 \text{ ms}}{2n(\text{count})}$