Question on Sequential circuit

1. What is sequential circuit.differentiate between the combinational circuit and the sequential circuit.
2. Explain JK and D flip flop with their logic diagram, graphical symbol, characteristic table, characteristic equation and excitation table.
3. Describe Race around condition in JK flipflop .Explain the working of master slave flipflop detailly.
4. What is counter? Differentiate between synchronous and asynchronous counter.
5. Draw and explain 3-bit asynchronous Up counter with timing diagram.
6. What is shift register. Draw a block diagram, truth table and timing diagram to store 2001 in 4-bit SIPO ,PISO register.
7. Design synchronous Decade counter using T Flip flop?
8. Design synchronous MOD-10 counter using clocked T Flip flop?
9. Design a sequenc detector that detect the sequence 1101 when a given sequence is detected the machine will produce output 1.Design a given circuit using JK flipflop.
10. A sequential circuit with two D flip flops, A and B, two inputs x and y, and one output z, us specified by the following next state and output equations.  
    A(t + 1)=x'y + xA  
    B(t + 1)=x/B + xA  
    z=B  
    a) Draw the logic diagram.  
    b) Derive the state table.  
    c) Derive the state diagram.
11. A sequential circuit has two JK flip-flops A and B and one input x. The circuit is described by the following flip-flop input equations:

JA = x KA = B'

JB = x KB = A

(a) Derive the state equations A(t + 1) and B(t + 1) by substituting the input equations for the J and K variables.

(b) Draw the state diagram of the circuit.

Short Notes on

State Reduction

State Diagram