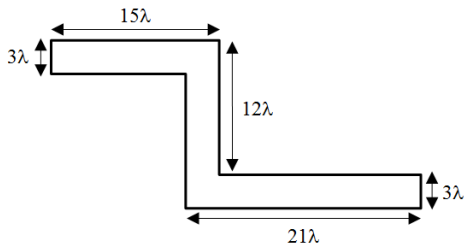
Assignment:

To be submitted on 2nd June 2017

Answer the following questions:

1. Define and explain the following terms with necessary diagrams: fan-out, propagation delay, noise margin, power dissipation and power delay product.
2. Simplify the Boolean function using variable entered map (VEM).
   F(A, B, C, D, E) = ∑ (0, 1, 7, 8, 9, 15, 16, 17, 22, 24, 25, 31)
   with don't care = ∑ (2, 20, 23)
3. Simplify the following Boolean function using Quine-McCluskey method.
   F(A, B, C, D) = ∑ (0, 1, 3, 7, 10, 11, 14, 15)
   with don't care = ∑ (5, 9, 12)
4. Design a sequential machine which produces output 1 when the sequence 1000 is detected. Use T flip-flop.
5. What is input forming logic (IFL) and output forming logic (OFL)? Explain the principles for designing IFL and OFL with examples.
6. What is parasitic? Discuss briefly on transistor and wire parasitics. Compute the resistance and capacitance of n-diffusion wire given below (for 0.5μm process). Parameters of n-diffusion wire for 0.5 μm process:
   Bottomwall capacitance: 0.6 fF/μm2,
   Sidewall capacitance : 0.2 fF/ μm and
   Resistivity: 2Ω / □



7. What are the errors during fabrication of transistor, wire and vias? What is design rule? Explain the need of design rules with examples.
8. Explain the function of ripple carry and carry look-ahead adder.
9. Differentiate:
   a) Mealy vs. Moore machine
   b) Synchronous vs. asynchronous machine
10. Write short note on:
    a) Properties of IC
    b) Mealy and Moore machine
    c) Power optimization
    d) Left edge channel routing algorithm

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