Haigazian University
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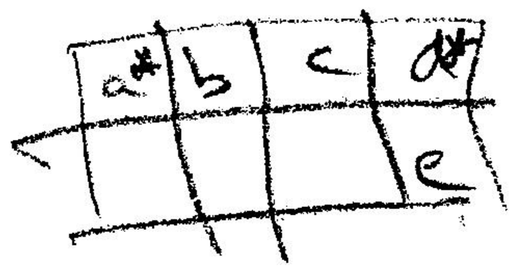
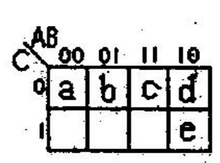
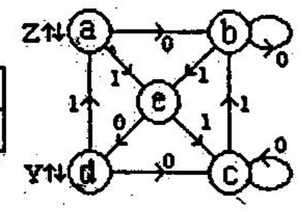
Name: ----------
May 23rd, 2005

PHY 233
QuizII



1. For the state transition diagram, **check** to see if the four principles and rules are satisfied by the state assignment map given.





(P1: 7pts. , P2: 5pts. , P3: 3pts. , Rule1: 5pts. Total: 20 pts.)

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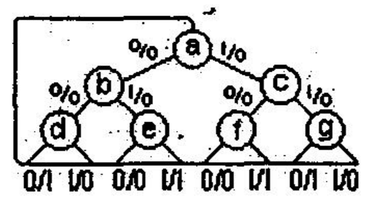
2. For the "Loose" state transition Diagram shown:

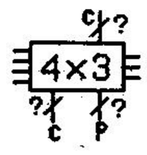
   a. Follow the method of partition to reduce the number of states. *(Show all your steps explicitly)* *(15 p)*

   b. Draw the *reduced* state transition diagram. *(5 p)*

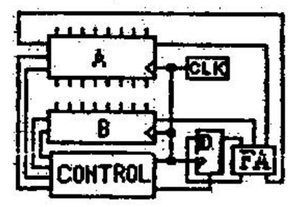


Answer two of the following three questions. *Note: The third answer will be ignored. (2x15=30 p)*

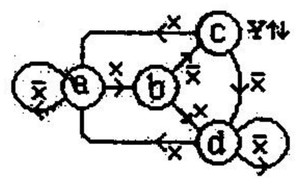
3A. Give the number of lines in each of the slashed lines of the 4x3 block shown . *(6 pts.)* Show how two such blocks can be used to construct an 4x6 multiplier. *(9 pts.)*



3B. For the adder shown, identify the 9 single wires *(other than CLK)* that *interconnect* the blocks by labels like: *Preset, Clear, Shift Left, Carry, etc. …* Assume that all the chips are already enabled.



3C. Show how the State Transition Diagram can be realized using the *ONE_HOT* method. You may use gates or Multiplexers as you please.



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3. Answer 5 of the following 8 questions briefly. Include a diagram wherever necessary.

   Note: The 6th answer will be ignored. *(6 x 5=30 p)*

   a. Explain why it may be wise to use *longer* than necessary labels in state assignment?

   b. From the technical *(not logical)* point of view, why is it necessary that each state has a next state?

   c. Why do we expect to find an OR gate at the input control of each flip-flop of a binary counter that can count down to zero starting from a given arbitrary number ?

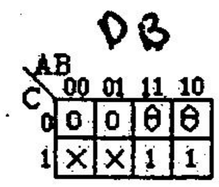
   d. ~~Define Clock Suppression and Alternate State Transition~~

   e. Give the algorithm of a Successive Approximation Register (SAR)

   f. Why is it unwise to branch on more than one asynchronous input?

   g. ~~Define Functional Partition and Datapath~~

   h. Convert the D_B map shown to J-K maps . *(No need to calculate J & K)*



Good Luck!

2x20 + 2x30 = 100

c 011
d 101

a 000
d (00)1

b 001
d 101