Saturday, February 24, 2018

Analysis and Design of Algorithms CSE 222

(IT IS MANDATORY TO LEAVE BEHIND YOUR SMART PHONE AND SMART WATCH)

Mid semestral exam, Winter, 2018, Total marks - 40, Time - 100 minutes

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1. Show the utility of augmenting path with an example, in context of flow network. (4 points)

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2. State True/ False with brief explanation (3 x 3 = 9 points)

a. If f(n) = Θ(g(n)) and g(n) = Θ(h(n)), then h(n) = Θ(f(n))

b. If f(n) = O(g(n)) and g(n) = O(h(n)), then h(n) = Ω(f(n))

c. If f(n) = O(g(n)) and g(n) = O(f(n)) then f(n) = g(n)

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3. Prove $O(\log_2 N) = O(\log_{10} N)$. (3 points)

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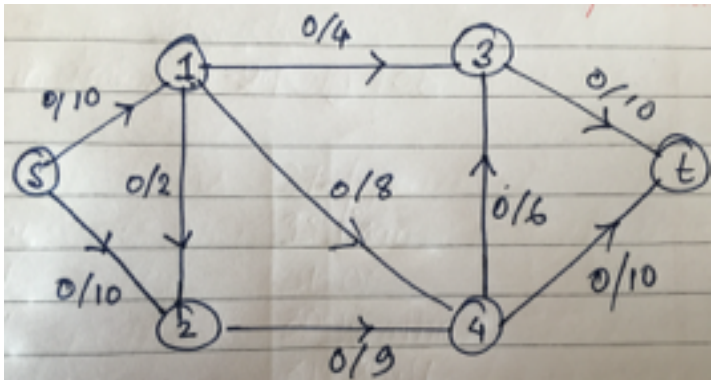
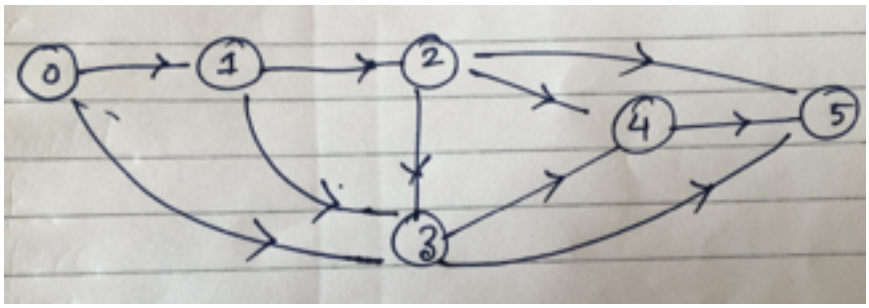
4. Find the max flow for the following flow graph. Show the steps. (6 points)



5. Write an efficient algorithm to check if a graph is bipartite. Comment on its time complexity. (4 + 1 = 5 points)

6. Write the pseudocode for Quick-Hull algorithm. (5 points)

7. Write the steps of an efficient algorithm for topological sorting of a DAG. Produce a topological ordering of the below graph. (4 + 4 = 8 points)