Dr. S. Shukla.

COURSE CODE: 10M11CI211   MAX. MARKS:25
COURSE NAME: ADVANCED ALGORITHMS
COURSE CREDITS: 3   MAX. TIME: 1.5 Hour

Note: All questions are compulsory. Carrying of a mobile phone during examinations will be treated as a case of unfair means.

Question 1: Write short nodes with examples: [10 Marks] [CO-1]
  i.   Asymptotic time complexity
  ii.   Eccentricity, diameter and radius of a graph.
  iii.   Cut-vertex/articulation point of a graph
  iv.   Quick hull
  v.   Duality in LPP.

Question 2:   [4 Marks][CO-3]
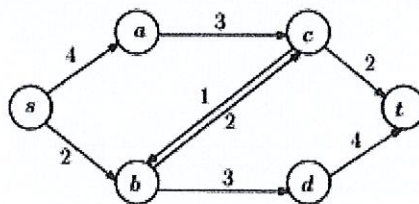Use dynamic programming to solve the given "0/1 Knapsack problem".

Knapsack size: 20

Items	X_1	X_2	X_3	X_4
W	6	12	4	16
P	12	12	32	32

Question 3:   [6 Marks][CO-5+CO-6]

Why the computation of maximum flow does not depend on the net outward flow from the source, and instead it is only a function of the capacities? Find the max flow and LP representation for the given graph?

Question 4:   [5 Marks][CO-7]
What are the main steps for designing an approximation algorithm? How does lower bound of a problem play role in deriving approximation ratio? Give a 2-approximation algorithm for VERTEX-COVER ?