Course name: **Advanced Algorithms** Course code: **CS 601**
Instructor: **Dr. Vidhyacharan Bhaskar**

Instructions: a) Exercise problems could be hand-written or printed.
b) Computer projects must be printed (need both source code and the output).
c) Show the entire working for all handwritten homeworks.

Total: 50 points **Homework assignment 3** (Due date: **Oct 20, 2020 – beginning of class**)

Chapter 5 problems:

1. Exercise 5.2
2. Exercise 5.4
3. Exercise 5.6

Chapter 6 problems:

Problems 4 through 7: See the attached file.

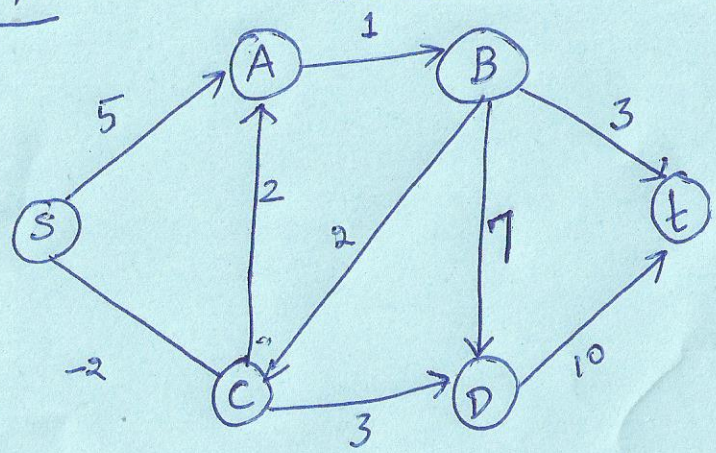
8. Problem 6.3

9. Problem 6.4

10. Problem 6.10

## Problem 4

## Bellman ford algorithm

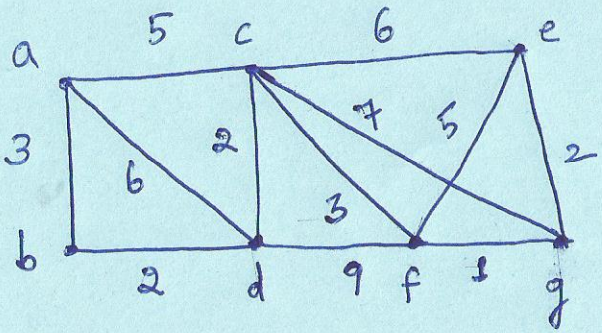



V = 6 nodes

$|V-1| = 5$ iterations (max)

## Problem 5

## Dijkstra's algorithm




Source : a

Target : Any other node.

## Karatsuba multiplication

**Problem 6 :**

Compute the value of $1234 * 4321$ using Karatsuba multiplication method.

## Problem 7 :

Given vectors

$\underline{a} = (1, 2, 1)$ and

$\underline{b} = (1, 3, 3, 1)$. Let

$A(x) = 1 + 2x + x^2$

$B(x) = 1 + 3x + 3x^2 + x^3$.

Compute $C(x) = A(x)\,B(x)$

You can read off the coefficients of $C(x)$ from $\underline{c} = (c_0, c_1, c_2 \ldots)$, where $\underline{c} = \underline{a} * \underline{b}$. Follow algorithm on Pag 238.