MASSACHUSETTS INSTITUTE OF TECHNOLOGY

15.082J/6.855J/ESD.78J – Network Optimization (Fall 2010)

Problem Set 3

Due Session 13
at the <u>beginning</u> of class

Hand in the exercises labeled 1, 2, 3, 4 and 5.

READINGS in AMO.

- Chapter 6, "Maximum Flows: Basic Ideas," pages 166 to 197
- Sections 7.1 to 7.5 in Chapter 7, " Maximum Flows: Polynomial Algorithms," pages 207 to 223

HOMEWORK EXERCISES. Chapters 6 and 7 of AMO

Exercise 6.3

Exercise 6.11

1. Exercise 6.12

2. Exercise 6.16

Exercise 6.25

Exercise 6.31

3. Exercise 6.30 HINT: Let (i, j) be an arc for which $x_{ij} = u_{ij}$ in every maximum flow. Let x* be some optimal flow.
Let S* = {k $\in$ N: there is a path from i to k in G(x*) }. Let T* = N\S*. Show that (S*, T*) is a minimum capacity s-t cut and that i $\in$ S* and j $\in$ T*.

4. Exercise 6.34 (For true statements,
it suffices to give a brief explanation)

Exercise 7.3

5. Exercise 7.8 (For true statements,
it suffices to give a brief explanation)