

# Homework A

*Due: 27 May 2009*

## Problem A.1

Suppose that you wanted to send an email whose entire body was the following message:

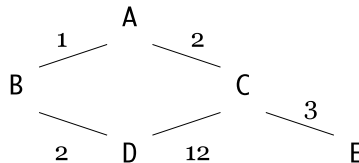
Très bien. => Ne donnez la traduction à personne !

What character set would be appropriate to use? What would be the Content-Type (according to the MIME standard)? Assuming the message will be transmitted over plain SMTP (ruling out 8-bit transfer encodings), what would be the preferred Content-Transfer-Encoding for the message?

Using your chosen settings, give the byte-for-byte encoding of the message; what you hand in should be clear but also concise.

## Problem A.2

Consider the following subnet graph:



What is the best (shortest) route for a packet sent from node C to node D? Assume that the edge weights are stable and give the distance vector for node C—that is, for every node, give its shortest-path distance from C and the outbound link from C that a route to that node should take.

Then, describe how the distance-vector routing algorithm would respond to the A-C link going down. In the immediately subsequent update, what would C's new distance vector look like? How long would it take for all the routers in the system to converge on the new best routes?

## Problem A.3

Could a NAT box exist inside a network already behind a NAT? How would that work, or why not? Can a single network have multiple NAT gateways to the outside world? How, or why not?