S-38.3610 Network Programming / Examination 18.5.2011

Answers to separate form.
Remember to state your name and student number

1. **Explain the communication behavior with stream sockets and TCP when application issues a) 'read' call and b) 'write' call. Focus on interactions with socket buffers. What happens when buffer is full, what happens when buffer is empty? (4p)**

2. **What do the following socket calls do, and why are they used (4p)**

a) ntohs

b) getsockname

c) setsockopt

d) getaddrinfo

3. **Describe the necessary steps for creating a server socket that accepts incoming connections, and how the socket is then used for communicating with clients (in this answer you can ignore the issues related to concurrent processing of multiple clients) (5p)**

4. **Describe two different design alternatives for a concurrent server that is able to process multiple clients. Outline the procedure of a new client connecting to server, client closing connection and leaving, and the basic read/write operations (6p)**

5. **Connection establishment with TCP can fail, for example, when a) client attempts connection to a port that server is not listening, or b) when server host is not connected to network. Describe what happens in these failure situations and how does the client application notice the error. How would the situation be different with UDP socket? (4p)**

6. **How can a developer ensure that an application supports both IPv6 and IPv4? What kind of problem situations can occur (for example, due to lacking IPv6 deployment) and how can an application handle such situations robustly? (4p)**