

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination: Semester 1

Academic Year: 2005-2006

Date: August 1, 2005

Time: 09:00 – 12:00

Subject Number: 240-574

Room: A203

Subject Title: Special Topics in Information Network Engineering I
(The Internet and its Protocols)

Exam Duration: 3 hours

This paper has 3 pages (including this page).

Authorised Materials:

- Anything the student can carry, except for mobile phones.

Instructions to Students:

- *Answer questions in English.* Good English is **not** required.
- Attempt all 5 questions.
- Write answers in an answer book.
- Start the answer to each question on a new page.
- **Clearly Number** the answers. It is **not** required that questions be answered in order.
- Anything illegible is incorrect.
- Answer briefly where possible, essays are **not** required.
- The marks allocated for each question are shown next to that question. There are 60 marks total for this examination. This will contribute 30% of the course total.

Question 1. (20 marks)

Give an example of a protocol where a scaling issue caused the protocol to be revised.

Explain the issue (the original problem), and show how it has been overcome.

Question 2. (6 marks)

What is the most important value to know when attempting to determine the maximum throughput obtainable using the TFTP protocol?

What about the design of the TFTP protocol causes that particular value to be most important?

For file transfers using protocols based upon TCP, what additional factors become important to determining the maximum throughput that is possible?

Question 3. (8 marks)

Give two (different) mechanisms that can be incorporated into a protocol to allow the protocol to be extended later.

Explain in each case how that might be accomplished, using examples from real protocols where possible.

Note: for this question, the two mechanisms in your answer should be of different types, not just two variants of the same basic technique.

Question 4. (6 marks)

What purpose does UDP serve in the set of Internet Protocols?

Why would an application protocol choose to use UDP rather than TCP?

What does an application using UDP gain by using UDP rather than simply using IP datagrams with no transport protocol at all?

Question 5.

(20 marks)

Explain why altering the service provider of a network (the ISP) may cause TCP connections that are open to fail.

What about TCP causes this to happen?

Why should altering the place of connection to the network (the service provider) cause this to be affected?

What could be altered, either in TCP or elsewhere, to avoid this problem?

What might be the side effects of such an alteration (or, why has this not already been done) ?