

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Final Examination: Semester 1

Academic Year: 2010-2011

Date: October 8, 2010 (2553)

Time: 09:00 – 12:00

Subject Number: 241-643

Room: Robots Lecture Theatre

Subject Title: The Internet and its Protocols

Name: _____ Student Number: _____

Exam Duration: 3 hours

This paper has 7 pages (including this page).

- Write the answers in the spaces provided in the examination paper.
- Clearly write your student number in the space provided at the top of each page. Write your name and student number in the spaces provided on this cover page.
- There are 105 marks total for this exam. This will contribute 35% of the course total.

Authorised Materials:

- Anything the student can carry (except communication devices.)

Instructions to Students:

- Attempt all 6 questions .
- Anything illegible is incorrect.
- Answer briefly where possible, essays are **not** required . There is no need to use all of the space provided for each answer!
- The marks allocated for each question are shown next to that question.
- *Answer questions in English.* Good English is **not** required.

For marker's use only.

| 1 | 2 | 3 | 4 | 5 | 6 | Total |
|---|---|---|---|---|---|-------|
| | | | | | | |

Question 1.

(30 marks)

When would a protocol designer be likely to choose to use a grammar when designing a protocol? (To explain: What kind of protocol would the designer be designing if a grammar was selected as a tool?)

[10 marks]

What advantages does using a grammar offer to the designer?

[6 marks]

What disadvantages are there when a grammar is used?

[6 marks]

What alternative methods might be used to assist in the design of a protocol if a grammar is not appropriate?

[8 marks]

Question 2.

(15 marks)

If it desires, a TCP system can almost always avoid IP fragmentation. UDP however cannot guarantee to avoid fragmentation. What is the difference between the natures of TCP and UDP that leads to this result?

[4 marks]

What is the mechanism that is used when a system (like TCP, or perhaps an application using UDP) wishes to avoid fragmentation?

[2 marks]

How does it work?

[6 marks]

Is there any other method by which fragmentation can be avoided? If so, what is it? Under what circumstances might this be practical?

[3 marks]

Question 3.

(20 marks)

Which do you believe is more important when designing a protocol, efficiency or extensibility?

[1 mark]

Why?

[10 marks]

Give examples from protocols that support your argument (which can be cases where a positive result was achieved from following the advice you would give, or cases where a poor result was achieved after adopting the other approach).

[9 marks]

Question 5.

(10 marks)

Some protocols use a binary packet format with fixed fields, others protocols use a binary packet format with an encoded representation of what the various data represents, and yet other protocols use a text based packet format, with words (or strings that approximate words) as the field identification.

Given an example of a protocol of each type.

[4 marks]

Explain in what circumstances each might be a suitable technique to use when a new protocol is to be defined.

[6 marks]
