

PRINCE OF SONGKLA UNIVERSITY  
FACULTY OF ENGINEERING

**Midterm Examination:** Semester 1

**Academic Year:** 2010-2011

**Date:** August 4, 2010 (2553)

**Time:** 09:00 – 12:00

**Subject Number:** 241-643

**Room:** A201

**Subject Title:** The Internet and its Protocols

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Name: \_\_\_\_\_

Student Number: \_\_\_\_\_

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**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 70 marks total for this exam. This will contribute 20% of the course total.

**Authorised Materials:**

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

**Instructions to Students:**

- Attempt all 5 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.

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*For marker's use only.*

1	2	3	4	5	Total

**Question 1.**

*(30 marks)*

The design of protocols such as TCP, and TFTP (and others) imposes an upper bound upon the rate at which data can be exchanged, which simply increasing the bandwidth of the path between the systems communicating cannot significantly alter.

- A) Explain what it is about the protocols that causes this speed limit, and what factors influence its value.

[10 marks]

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- B) Explain how a protocol designer calculates the maximum rate at which the protocol can transfer data.

[5 marks]

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- C) What modifications are possible (and practical) to a protocol to allow the speed limit to be increased?

[5 marks]

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- D) To avoid this limit completely, and allow the maximum speed of a connection to be controlled only by the available bandwidth, some other features of the protocol will either need to be done in totally different way, or be dropped completely. What features are those, and why are they related this way?

[10 marks]

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**Question 5.**

*(5 marks)*

When numbers are allocated for purposes such as addressing node in a network, some of the available numbers, numbers which were available to be used, will in practice not be used – that is, effectively be wasted.

- A) Explain why it is not possible in practice to use all the available numbers.

[3 marks]

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- B) What effect does having multiple levels of assignment hierarchy have upon these effects?

[2 marks]

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