PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination: Semester 2   **Academic Year:** 2004-2005

Date: December 24, 2004   **Time:** 09:00 – 12:00

Subject Number: 240-642   **Room:** A400

Subject Title: Multicast Protocol & Applications

Exam Duration: 3 hours

This paper has 2 pages (including this page).

Authorised Materials:

- Anything the student can carry.

Instructions to Students:

- *Answer questions in English.* Good English is **not** required.

- Attempt all 4 questions.

- Write answers in an answer book.

- **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 30 marks total for this examination. This will contribute 30% of the course total.

Question 1.   *(8 marks)*

Multicast routing can be described as being the process of determining where **not** to send multicast packets. Do you agree? Explain why?

Give at least 2 examples of methods a multicast router might use to restrict where to forward multicast packets that have been received and are being processed.

Question 2.   *(7 marks)*

How might an ethernet switch use the IGMP (for IPv4, or MLD for IPv6) protocol to improve ethernet switching of multicast packets?

In your answer, explain the task the switch is performing, what the issues are that it needs to solve, and how IGMP (or MLD) is used to assist.

Does the version of IGMP (or MLD) being used affect the switch? If so, how.

Question 3.   *(5 marks)*

Before sending a unicast packet over an ethernet, a host (or router) uses the ARP protocol (for IPv4, Neighbor Discovery for IPv6) to determine the ethernet address (link layer address) which it should use as the destination address in the ethernet frame.

Explain the corresponding process for multicast packets.

Question 4.   *(10 marks)*

What is the function of the Reverse Path Forwarding (RPF) algorithm in a multicast router?

Give an example of what might happen if RPF were not used, and explain how using RPF avoids the problem in your example.