

PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination: Semester 2

Academic Year: 2007-2008

Date: December 28, 2007

Time: 13:30 – 16:30

Subject Number: 240-642

Room: R201

Subject Title: Multicast Protocols and Applications

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.
- 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.
- 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. Questions assigned higher numbers of marks expect a more detailed and thorough answer than questions allocated less marks.
- Attempt all 6 questions.
- Anything illegible is incorrect.
- Answer briefly where possible, essays are **not** required.

Question 1.*(10 marks)*

Explain the reasons why a DVMRP (Distance Vector Multicast Routing Protocol) router periodically forgets (discards) all state relating to PRUNE messages it has received.

Explain what occurs in the network when PRUNE state is discarded, and what that means to the traffic on the network when observed over a lengthy period.

Question 2.*(10 marks)*

Multicast using MOSPF (Multicast Open Shortest Path First) as its routing protocol is routed quite differently than multicast using DVMRP.

Explain the most significant differences.

What are the advantages and disadvantages of each of those two multicast routing protocols?

Why is MOSPF rarely used?

Question 3.*(15 marks)*

PIM (Protocol Independent Multicast) has two variants - **Dense** mode PIM, and **Sparse** mode PIM.

3. A) Explain the major differences between those two variants of PIM, indicating in what kinds of networks each might be preferred.

[7 marks]

3. B) Explain the differences between PIM and DVMRP, indicating why PIM is replacing DVMRP as the most common intra-network multicast routing protocol.

[8 marks]

Question 4.*(5 marks)*

Explain why it is never correct for a router forwarding a multicast packet to transmit the packet back through the same interface from which it was received (in contrast to a router forwarding a unicast packet which sometimes needs to do that.)

Question 5.

(10 marks)

Explain why the **IGMP** (Internet Group Management Protocol) versions 1 and 2, **REPORT** messages sometimes do not need to be sent by nodes that are members of a group, and what impact that has upon the operation of the protocol, and other devices on the network.

Question 6.

(10 marks)

Multicast routing can sometimes be described as being the process of determining where **not** to send multicast packets.

Do you agree?

Explain why (or why not)?