INSTITUTE OF TECHNOLOGY

BLANCHARDSTOWN

Year	Year 2
Semester	Semester 1 (Repeats)
Date of Examination	**Wednesday 17th August 2011**
Time of Examination	**1.00pm - 3.00pm**

Prog Code	BN002	**Prog Title**	Higher Certificate in Computing in Information Technology	**Module Code**	COMP H2015
Prog Code	BN013	**Prog Title**	Bachelor of Science in Computing in Information Technology	**Module Code**	COMP H2015
Prog Code	BN104	**Prog Title**	Bachelor of Science (Honours) in Computing	**Module Code**	COMP H2015

Module Title	Switching Basics and Intermediate Routing

Internal Examiner(s): *Mr Mark Cummins*
External Examiner(s): *Dr Richard Studdert, Mr John Dunnion*

Instructions to candidates:

1) **To ensure that you take the correct examination, please check that the module and programme which you are following is listed in the tables above.**
2) **Attempt ALL PARTS of Question 1 and any THREE other questions.**
3) **This paper is worth 100 marks . Question 1 is worth 40 marks and all other questions are worth 20 marks each.**

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Section A: Attempt ALL parts of this question

Question 1: All parts are worth 4 marks each

a) What is the purpose of performing regular traffic flow analysis?

b) List and briefly describe any 4 benefits of implementing VLANs.

c) What is the purpose of VTP pruning?

d) How does an Ethernet switch process incoming traffic using port-based memory buffering?

e) Which three 802.11b RF channels would allow three wireless AP's to operate simultaneously in the same room with no channel overlap?

f) Describe how an attacker might create a DoS attack against a wireless LAN.

g) Explain the STP process for electing a root bridge.

h) List any four Cisco or IEEE STP variants.

i) Which three STP port states will discard data traffic during STP operations?

j) An Ethernet switch has built the MAC address table shown. What action will the switch take when it receives the frame shown at the bottom of the exhibit?

MAC address table

Station	Interface 1	Interface 2	Interface 3	Interface 4
00-00-3d-1f-11-01				X
00-00-3d-1f-11-02		X		
00-00-3d-1f-11-03			X	

Frame

Destination	Source
00-00-3d-1f-11-02	00-00-3d-1f-11-01

Section B: Answer ANY 3 questions from this section

(All questions carry equal marks)

Question 2:

a) The typical hierarchical design model is broken into three layers. List and describe the function of each of these layers. **(6 marks)**

b) When selecting a switch for a hierarchical network you have to consider the capability of the switch to support the **port density**, **forwarding rate** and **bandwidth aggregation** requirements of your network, explain each of these three features. **(6 marks)**

c) What is the function of a user community analysis? **(4 marks)**

d) Two advanced features of switches are PoE and layer 3 functionality, explain each of these features. **(4 marks)**

(Total 20 marks)

Question 3:

a) Describe the process used to populate the MAC address table on a switch. **(6 marks)**

b) Switches use one of two methods for switching data between network ports. Describe the operation of each of these methods and their variants. **(10 marks)**

c) Explain each of the two types of memory buffering used by modern switches. **(4 marks)**

(Total 20 marks)

Question 4:

a) Compare and contrast normal range and extended range VLANs. **(4 marks)**

b) A network technician has created multiple VLANs on two switches and set up a trunk between them (no other network devices have been set up). During testing she discovers that pings from PC-A to PC-B (both on VLAN 1) work as expected and pings from PC-C to PC-D (both on VLAN 99) also work as expected. However PC-A is unable to ping either PC-C or PC-D. What is the likely cause of this problem and how would you solve it? **(6 marks)**

c) By default everything on a switch is dumped into VLAN 1 (Management VLAN, Native VLAN, all ports etc.). This can create a number of security issues. What steps you would recommend to a new technician who was setting up a new switch with a number of VLANs? **(6 marks)**

d) What is the role of the native VLAN? **(2 marks)**

e) What two trunk encapsulation options are available on legacy cisco switches? **(2 marks)**

(Total 20 marks)

Question 5:

a) Compare and contrast each of the four wireless LAN standards 801.11a, 801.11.b, 801.11g and 801.11n, under each of the following headings:

1. Band
2. Modulation
3. Data rates

(12 marks)

b) Wireless access points use CSMA/CA. Explain the hidden node problem and outline how CSMA/CA overcomes this problem.

(8 marks)

(Total 20 marks)