INSTITUTE OF TECHNOLOGY

BLANCHARDSTOWN

Year	Year 2
Semester	Semester 1
Date of Examination	**Wednesday 14th January 2009**
Time of Examination	**9.30am – 11.30am**

Prog Code	BN002	**Prog Title**	**Higher Certificate in Science 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) Explain in detail the root bridge election process.

b) Outline the advantages of WiFi certification.

c) Outline how someone might perform a man-in-the-middle attack on a wireless access point.

d) List each of the possible VTP modes.

e) What is the function of VTP Pruning?

f) What is the Purpose of the VLAN Trunking Protocol?

g) 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	Interface
00-00-3d-1f-11-02	00-00-3d-1f-11-04	2

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

i) Briefly describe each of the three main WLAN security protocols.

j)

1. Explain the difference between full duplex and half duplex
2. Explain the difference between symmetric and asymmetric switching

Section B: Answer ANY 3 questions from this section

(All questions carry equal marks)

Question 2:

a) Describe with the aid of a diagram; the two problems associated with redundant switched Ethernet topologies.

(10 marks)

b) Copy the diagram below into your answer booklet. In your diagram you should indicate the final designation of each port after the STP has completed. (i.e. show all root ports, designated ports and non-designated ports). Assume all path costs are equal.

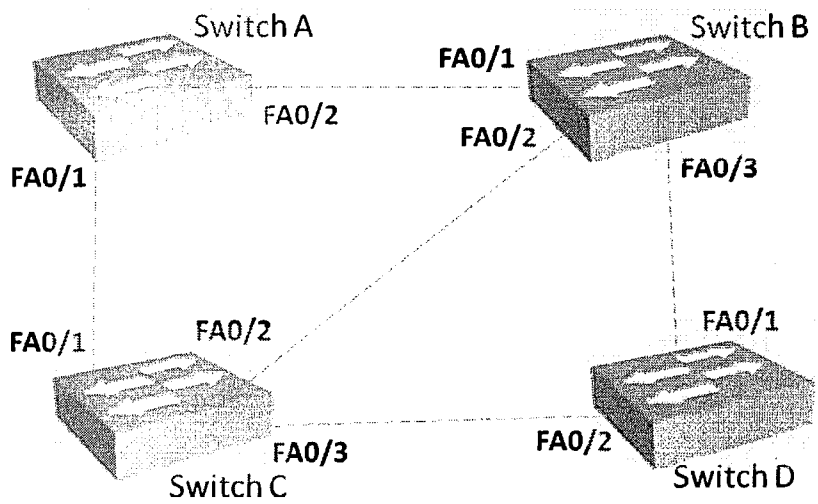
(10 marks)

Switch A	
Priority:	**32769**
MAC:	**000A00222222**

Switch B	
Priority:	**32769**
MAC:	**000A00333333**

Switch C	
Priority:	**24577**
MAC:	**000A00444444**

Switch D	
Priority:	**24577**
MAC:	**000A00555555**



Question 3:

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) A key part of the 802.11 process is discovering a WLAN and subsequently connecting to it. The primary components of this process are beacons, probes, authentication and association. Briefly explain each of these components.

(8 marks)

Question 4:

a) Hierarchical network design involves dividing the network into discrete layers. List and describe each of the layers of the hierarchical design model.

(9 marks)

b) List any five of the benefits associated with hierarchical network design.

(5 marks)

c) Briefly explain each of the following terms

1. Network diameter
2. Bandwidth aggregation
3. Converged network

(6 marks)

Question 5:

a) Explain each of the following terms

1. Default VLAN
2. Management VLAN

(4 marks)

b) Briefly outline some of the benefits of using VLANs as part of your network design, particularly in relation to controlling broadcast domains.

(6 marks)

c) What is the primary advantage in using VLAN Trunking?

(2 marks)

d) What are the two possible encapsulation modes for a VLAN trunk, when using a Cisco switch?

(2 marks)

e) **Briefly** describe why VLAN tagging is needed when using VLAN Trunking, and the purpose of the native VLAN.

(6 marks)