Institute of Technology Blanchardstown
Institiúid Teicneolaíochta Baile Bhlainséir

INSTITUTE OF TECHNOLOGY

BLANCHARDSTOWN

Year	Year 2
Semester	Semester 3
Date of Examination	Tuesday 19th January 2010
Time of Examination	3.30 – 5.30

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 recommended percentage overlap between two wireless access points, to allow seamless handover and provide uninterrupted connectivity for users moving between the two access points?

b) Explain the term "War Driving" in relation to wireless LAN security.

c) What is the function of VTP Pruning?

d) 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	3

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

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

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

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

i) List each of the five STP port states, which a switch will transition through during the operation of STP

j) Describe the purpose of traffic flow analysis

Section B: Answer ANY 3 questions from this section

(All questions carry equal marks)

Question 2:

a) Briefly outline the features of any four of the key Cisco and IEEE STP variants

(8 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, non-designated ports)

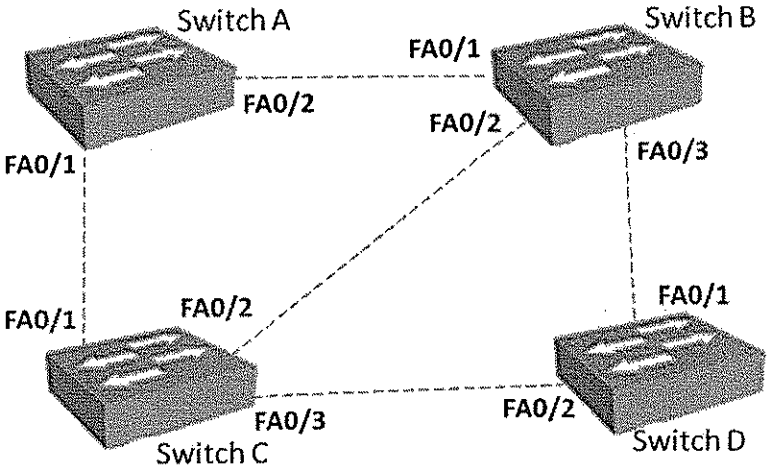
(10 marks)

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

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

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

Switch D	
Priority:	**24577**
MAC:	**000A00333333**



c) Describe the function of a RSTP edge port.

(2 marks)

Question 3:

a) Explain, with the aid of a diagram, the hidden node problem as it relates to wireless access points.

(6 marks)

b) Outline the CSMA/CA feature used to resolve the hidden node problem.

(2 marks)

c) A key part of the 802.11 process is discovering a WLAN and subsequently connecting to it. Briefly outline each of the four primary components of this process.

(8 marks)

d) Which IEEE standard should most enterprise networks follow to help ensure a secure wireless network?

(2 marks)

e) Why do devices such as microwave ovens and baby monitors, sometimes interfere with wireless access points?

(2 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

   a. Native VLAN
   b. Management VLAN

(8 marks)

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

(2 marks)

c) What is the purpose of IEEE 802.1Q frame tagging?

(2 marks)

d) VLANs are divided numerically into a normal range and an extended range. Compare and contrast the characteristics of normal and extended VLAN ranges.

(8 marks)