



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION SEMESTER II SESSION 2009/2010

SUBJECT NAME : NETWORK DESIGN
SUBJECT CODE : BIT 3303
COURSE : 3 BIT / 4 BIT
EXAMINATION DATE : APRIL / MAY 2010
DURATION : 2 HOUR 30 MINUTES
INSTRUCTION : ANSWER ALL QUESTIONS.

THIS QUESTION PAPER CONTAINS **FOUR (4)** PAGES

Instruction: Answer **ALL** questions.

- Q1**
- (a) Discuss the importance of using a structured model for addressing and naming. (6 marks)
 - (b) Justify when is it appropriate to use static versus dynamic addressing? (6 marks)
 - (c) Discuss **FOUR (4)** main issues for Wireless Installations. (8 marks)
- Q2**
- (a) Differentiate hierarchy and flat model design by illustrating the appropriate diagram. (2 marks)
 - (b) Justify **THREE (3)** factors that will help you to decide whether distance-vector or link-state routing is best for your design. (6 marks)
 - (c) Discuss **THREE (3)** approaches in upgrading IPv4 to IPv6. (12 marks)

Q3 Given the following case study:

Faculty of Information Technology and Multimedia (FTMM) in UTHM needs to update its existing LAN infrastructure. Faculty has FOUR (4) main buildings and some other rooms which are used as labs. At present, there is some ad-hoc LAN cabling in each of the four buildings, to connect some PCs to a server in each building. None of the four LANs are connected to each other. Very cheap 8-port hubs are used at present.

Faculty wants to future-proof its new LAN, so that it will last for about 3-5 years. Faculty also wishes to divide PCs and servers up into TWO (2) categories: student machines and staff machines. Faculty wants the LAN to be designed so that student machines cannot communicate with staff machines. At the same time, faculty does not want any restrictions on where a student or a staff machine can be located.

FTMM wishes to keep the four servers that it is presently using. Three servers are for student use, and one server is for staff use only. All FOUR (4) servers should be accessible from all buildings.

All PCs and servers will use IPv4 over Ethernet as their Layer 2 and Layer 3 protocols. FTMM has obtained the Class-C network of 200.4.5.0 for this purpose.

FTMM also wishes that there be some redundancy in the network, so that failures of active devices or wiring do not always bring the whole network down.

- (a) Justify **ONE (1)** suitable recommendation for their types of media used in FTMM. (4 marks)
- (b) Discuss whether centralized cabling topology is suitable for FTMM. (5 marks)
- (c) Suggest **FOUR (4)** internetworking devices that suitable for FTMM network. (4 marks)
- (d) Justify the selection criteria for each of the internetworking devices suggested in **Q3(c)**. (4 marks)
- (e) Draw a logical network design to illustrate centralized cabling for FTMM. Note: Label your internetwork devices. (8 marks)

Q3 Given the following case study:

The state of Alaska, in conjunction with its school system, is considering the implementation, in the next FIVE (5) years, of a statewide multimedia network that will reach students in both remote and populated areas. Students will be able to take noncredit classes for personal development, and credit classes that count toward degree programs. Students will "attend" by connecting to the networks at the state universities and community colleges. Students will be able to take classes by using home computers, going to libraries to use computers, and by going to educational resource centers in local schools.

- (a) Justify **FIVE (5)** technical goals of the state of Alaska associates on their network design project. (15 marks)
- (b) Discuss **ONE (1)** suitable recommendation for their;
- (i) Wide Area Network (WAN) technology. (7 marks)
- (ii) technology for supporting remote users. (7 marks)
- (c) Draw appropriate diagram, showing how firewall can be implemented for the state wide educational network. (6 marks)