UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAM
SEMESTER I
SESSION 2011/2012

COURSE NAME	:	HIGH SPEED NETWORK
COURSE CODE	:	BIT 3293 / BIT 32903
PROGRAMME	:	BACHELOR OF INFORMATION TECHNOLOGY
EXAMINATION DATE	:	JANUARY 2012
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **FOUR(4)** ONLY FROM **FIVE(5)** QUESTIONS.

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

Instruction: Answer FOUR(4) only from FIVE(5) questions

Q1 (a) Asynchronous Transfer Mode (ATM), developed by the CCITT standardization body, has gained wide acceptance for network interoperability. Describe **THREE(3)** factors that help ATM popularity.

(6 marks)

(b) Explain **THREE(3)** advantages of ATM switching compared to the shared bus technologies such as Ethernet.

(6 marks)

(c) Illustrate the access method used in ATM with appropriate diagram.

(7 marks)

(d) Differentiate the single mode and multi-mode fiber optic cables. Include the application of the cable in various LAN/WAN technology.

(6 marks)

Q2 (a) Given the following case study:

A new campus is to be setup in Pagoh, Johor for 8 universities all at one location to run many diploma programs with shared facilities. The network size will be like a new full size university campus. From network infrastructure aspect, a good topology that can offer high speed and reliable communication for the new campus backbone network is needed.

Draw a diagram to propose possible network topology for the backbone. Describe your proposed diagram.

(9 marks)

(b) Given the following case study:

With growing enrolment, UTHM has to expand its accommodation services, especially for new students. Every branch of UTHM accommodation hostel is expected to offer a 24 hour Internet connection. UTHM have decided to create WLANs for the hostel.

Analyze the decision by UTHM with highlights of the features and limitation of competing technology that may have been used for the hostels.

(6 marks)

(c) Frame Check Sequence is an error checking mechanism specified in all LAN frame format. Assuming a message 1001011101101 is to be transmitted using a CRC polynomial $X^4 + X^2 + X + 1$.

(i) Calculate the transmitted message using Cyclic Redundancy Check (show your work).

(5 marks)

(ii) Demonstrate how the receiver side knows that the message has been corrupted. Assume the 5th bit of the transmitted message flipped (1 becomes 0 or 0 becomes 1).

(5 marks)

Q3 (a) Given the following scenario:

Pak Badol and Pak Midol have configured the following network. As two seasoned network engineer they were to interview you for a job in Hospital Daerah Batu Pahat. Using the following figure, answer all of the following questions.

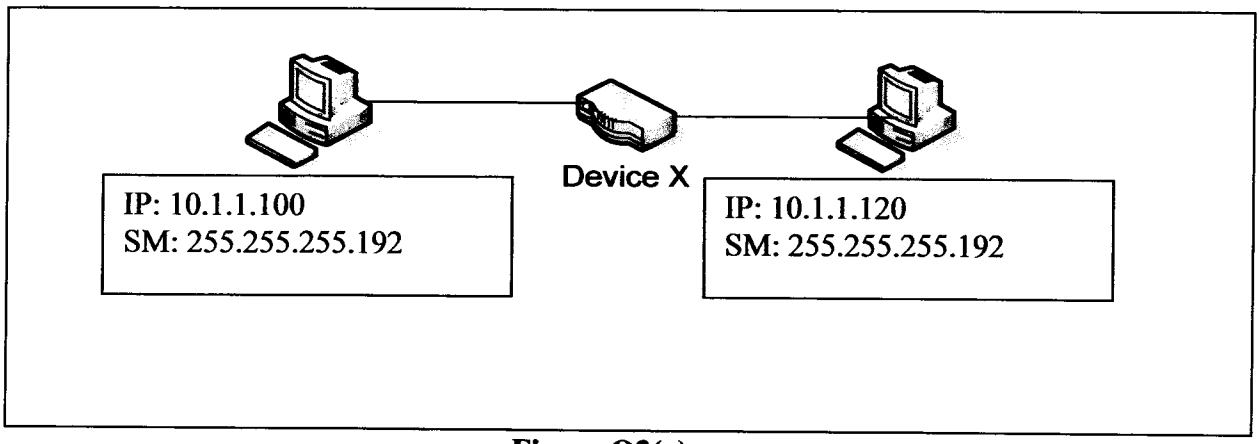

Figure Q3(a)

(i) State the length of an IP address.

(1 marks)

(ii) Identify the parts of IP address.

(1 marks)

(iii) Calculate the number of hosts in Class A IP address.

(1 marks)

(iv) State the default subnet mask normally assigned to a Class A IP address.

(1 marks)

(v) Carry out necessary steps to determine Device X by assuming pinging from Computer A to Computer B is successful.

(5 marks)

(b) Given the following **TWO(2)** case studies:

Case A: A new laboratory is to be setup at Kolej Profesional MARA Batu Pahat with 60 computers and 2 network printers.

Case B: Marahmarah and his wife Sukasuka are moving to their newly purchased home at Puri Kencana, Sri Gading. It has 6 bedrooms and 6 toilets. The stingy husband wants to have a home wired LAN but not willing at all to spend more that necessary to connect 6 PCs (i.e. cheapest). He had to implement an austerity measure to cut cost wherever possible.

(i) Propose suitable interconnection devices for each case by recommending number of devices with specific number of ports (state your reasoning to support your choice).

(8 marks)

(ii) Propose a suitable high speed WAN technology for each case (state your reasoning to support your choice).

(8 marks)

Q4 Given the following scenario:

Matarolling Sdn Bhd has hired you to advice on their new high speed campus network. After interviewing its IT Head, Dr. Sapiee Gameel, the following information has been determined:

Headquarters: Kuala Lumpur

No.	Department	Number of network node required
1.	Marketing	150
2.	Management	120
3.	R&D Department	50
4.	Product Development	21
5.	Strategic Planning	14

Northern Branch: Ipoh

No.	Department	Number of network node required
1.	Sales	123
2.	Executives	5

3 legal IPs have been purchased from Jaring - 190.1.1.0, 190.1.2.0, 190.1.3.0 with each default subnet mask 255.255.255.0. Besides that, they also have decided to provide email service to their staff, a web site to promote their college and also a streaming server. All nodes will be accessing the Internet using these legal IP, no internal IP addressing is allowed.

(a) Design a network diagram for Matarolling Sdn Bhd.

(4 marks)

(b) Calculate how many subnets are needed in Matarolling Sdn Bhd (list all of these subnets).

(2 marks)

(c) Produce a table that tabulates all the subnets. Consider the following information to be included in your table:

(i) Given IP
(ii) Subnet Address
(iii) Subnet Mask
(iv) Number of Host Supported
(v) Number of Host Needed
(vi) Address Range
(vii) Broadcast Address
(viii) Gateway Address
(ix) Assigned to where

(12 marks)

(d) Generate configurations for the following device:

(i) routers

(2 marks)

(ii) servers

(3 marks)

(iii) one(1) PC from each department.

(2 marks)

Q5 (a) Compare the access methods used in IEEE 802.3 and IEEE 802.5 (illustrate with suitable diagrams).

(8 marks)

(b) Demonstrate the improvement offered by FDDI access method compared with token ring access method (illustrate with suitable diagrams).

(8 marks)

(c) Differentiate all **THREE(3)** different flavors of IEEE 802.11.

(9 marks)