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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020**

COURSE NAME : COMPUTER NETWORKS
COURSE CODE : BIC 21303
PROGRAMME CODE : BIS / BIP / BIW / BIM
EXAMINATION DATE : JULY 2020
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : 1. ANSWER ALL QUESTIONS
2. PLEASE MAKE SURE TO
CLICK "SAVE ANSWER"
BUTTON FOR SUBJECTIVE
QUESTIONS. OBJECTIVE
QUESTIONS ARE SAVED
AUTOMATICALLY.

THIS QUESTION PAPER CONSISTS OF SEVEN (7) PAGES

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SECTION A

Instruction: Choose the BEST answer for each of the following questions.

- Q1** What action will occur if a switch receives a frame and does have the source MAC address in the MAC table?
- A. The switch refreshes the timer on that entry.
 - B. The switch adds it to its MAC address table associated with the port number
 - C. The switch forwards the frame to the associated port.
 - D. The switch sends the frame to a connected router because the destination MAC address is not local
- Q2** Which **THREE (3)** statements describe a DHCP Discover message? (Choose three)
- A. The source MAC address is 48 ones (FF-FF-FF-FF-FF-FF).
 - B. The destination IP address is 255.255.255.255.
 - C. The message comes from a server offering an IP address.
 - D. The message comes from a client seeking an IP address.
 - E. All hosts receive the message, but only a DHCP server replies.
- Q3** Which **TWO (2)** protocols may devices use in the application process that sends email? (Choose two)
- A. HTTP.
 - B. SMTP.
 - C. POP.
 - D. IMAP.
 - E. DNS.
- Q4** What are **TWO (2)** characteristics of peer-to-peer networks? (Choose two)
- A. Scalability.
 - B. One-way data flow.
 - C. Decentralized resources.
 - D. Centralized user accounts.
 - E. Resource sharing without a dedicated server.

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- Q5** Which **THREE (3)** protocols operate at the application layer of the TCP/IP model?
(Choose three)
- A. TCP
 - B. UDP
 - C. FTP
 - D. POP3
 - E. DHCP
- Q6** A manufacturing company subscribes to certain hosted services from its ISP. The services that are required include hosted World Wide Web, file transfer, and e-mail. Which protocols represent these **THREE (3)** key applications? (Choose three)
- A. FTP
 - B. HTTP
 - C. DNS
 - D. SNMP
 - E. SMTP
- Q7** eDonkey, eMule, BitTorrent, Bitcoin, and LionShare used _____ in networking model.
- A. peer-to-peer
 - B. client-based
 - C. master-slave
 - D. point-to-point
- Q8** What is the function of the HTTP GET message?
- A. To request an HTML page from a web server.
 - B. To send error information from a web server to a web client.
 - C. To upload content to a web server from a web client.
 - D. To retrieve client email from an email server using TCP port 110.

- Q9** Which example of malicious code would be classified as a Trojan horse?
- A. Malware that was written to look like a video game.
 - B. Malware that requires manual user intervention to spread between systems.
 - C. Malware that attaches itself to a legitimate program and spreads to other programs when launched.
 - D. Malware that can automatically spread from one system to another by exploiting a vulnerability in the target.

- Q10** A user is redesigning a network for a small company and wants to ensure security at a reasonable price. The user deploys a new application-aware firewall with intrusion detection capabilities on the Internet Service Provider (ISP) connection. The user installs a second firewall to separate the company network from the public network. Additionally, the user installs an Intrusion Prevention System (IPS) on the internal network of the company.

What approach is the user implementing?

- A. Attack based.
- B. Risk based.
- C. Structured.
- D. Layered.

(10 marks)

SECTION B

Q11 (a) In a data link connection where Cyclic Redundancy Check (CRC) is used, an 8-bit information is given as 11010110. The generating function used in the 'CRC' is $G(x) = x^4 + x + 1$.

- (i) Calculate the CRC code. (1 mark)
- (ii) Write the transmitted message, $T(x)$ polynomial corresponding to the bit string that will be sent. (2 marks)
- (iii) How does the receiver know that there is no error in the received message? Show your answer. (8 marks)

(b) The data block of six information bits and four control bits sent by computer A has arrived at the computer B with one information bit changed in transmission. The bit stream consisting of the data block and the control bits received by computer B is as follows:

I_1	I_2	I_3	I_4	I_5	I_6	C_1	C_2	C_3	C_4
1	1	0	1	1	1	0	0	1	1

Assume that both the source machine and the destination machine use the following functions to calculate the control bits:

$$C_1 = I_1 \text{ XOR } I_2 \text{ XOR } I_3; C_2 = I_1 \text{ XOR } I_4 \text{ XOR } I_5; C_3 = I_2 \text{ XOR } I_4 \text{ XOR } I_6; \\ C_4 = I_3 \text{ XOR } I_5 \text{ XOR } I_6$$

Which information bit is changed in transmission by assuming that control bits are not destroyed and only information bit is changed? Show your work. (9 marks)



Q12 Given the following scenario:

National Network Sdn Bhd has hired you to advise on their new high speed enterprise network. After interviewing its IT Head, Di. Mah Yi Din, the following information has been determined.

Headquarters. Kuala Lumpur

No	Department	Number of network node required
1	Deployment Access	153
2	Deployment Infra	121
3	R&D Department	50
4	Strategic Planning	13

Southern Branch: Johor Bahru

No	Department	Number of network node required
1	Sales	123
2	Executives	9
3	Product Development	22

3 legal IPs have been purchased from Jaring – 190.1.1.0, 190.1.2.0, 190.1.3.0 each with 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 company and also a streaming server. All nodes will be accessing the Internet using these legal IP, no internal IP addressing is allowed.

- (a) Sketch a network diagram for National Networks Sdn Bhd. (2 marks)
- (b) Produce a table that tabulates all the subnets. Consider the following information to be included in your table:
- Given IP
 - Subnet Address
 - Subnet Mask
 - Number of Host Supported
 - Number of Host Needed
 - Address Range
 - Broadcast Address
 - Gateway Address
 - Assigned to which department

(10 marks)

- (c) Using your table in **Q12(b)**, generate address configurations for the following devices:
- (i) All routers. (4 marks)
 - (ii) All servers (6 marks)
- (d) Using IOS Commands, write configuration commands you should perform at the following network devices:
- (i) On all routers. (6 marks)
 - (ii) One switch (choose any). (2 marks)

- END OF QUESTIONS -

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