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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2021/2022**

- COURSE NAME** : COMPUTER NETWORKS  
**COURSE CODE** : BIC 21303  
**PROGRAMME CODE** : BIS / BIP / BIW / BIM  
**EXAMINATION DATE** : JULY 2022  
**DURATION** : 3 HOURS  
**INSTRUCTION** : 1. ANSWER ALL QUESTIONS.  
2. THIS FINAL EXAMINATION IS AN ONLINE ASSESSMENT AND CONDUCTED VIA CLOSED BOOK.  
3. STUDENTS ARE PROHIBITED TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF NINE (9) PAGES

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**SECTION A**

**Instruction: Choose the BEST answer for each of the following** **CONFIDENTIAL**

**Q1** Which one is **NOT** a valid subnet mask?

- A. 255.255.255.252
- B. 255.255.224.0
- C. 255.240.0.0
- D. 254.0.0.0
- E. All of the above.

**Q2** What is the default subnet mask for host 130.20.20.20?

- A. 255.0.0.0
- B. 255.255.255.0
- C. 0.255.255.255
- D. 20.255.255.255
- E. None of the above.

**Q3** Which of the following is a device or function whose most notable feature is to encrypt packets before they pass through the Internet?

- A. Virtual Private Network (VPN).
- B. Firewall.
- C. Intrusion Detection System (IDS).
- D. Network Access Control (NAC).
- E. Router.

**Q4** In the URL `http://www.insaf.com/xhensempejb.html`, which part identifies the web server?

- A. `http`
- B. `www.insaf.com`
- C. `insaf.com`
- D. `http://www.insaf.com`
- E. The file `xhensempejb.html` includes the hostname.

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**Q5** Which network topology is suitable for a network backbone?

- A. Star.
- B. Bus.
- C. Ring.
- D. Mesh.
- E. Hybrid.

**Q6** Which term shows Gigabit Ethernet over Fiber Optics?

- A. 1000BaseSX.
- B. 1000BaseCX.
- C. 1000BaseT.
- D. 1000BaseFX.
- E. None of the above.

**Q7** Which standardization organization is responsible for the 802.3 standard?

- A. The International Standards Organization (ISO).
- B. The International Telecommunications Union (ITU).
- C. The Institute of Electrical and Electronics Engineers (IEEE).
- D. American National Standardization Institute (ANSI).
- E. None of the above.

**Q8** Which of the following **THREE** (3) are used to measure network performance?

- A. Bandwidth.
- B. Throughput.
- C. Line Speed.
- D. Goodput.
- E. Acceleration.

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**Q9** Which of the following is **NOT** a network architecture?

- A. Open System Interconnection.
- B. TCP/IP.
- C. AppleTalk.
- D. Ethernet.
- E. Novell Netware.

**Q10** What is the use of a `tracert` command?

- A. To view the delay time.
- B. To test if the device on the network is reachable.
- C. To view router hops.
- D. To test network connectivity.
- E. All of the above.

**Q11** Which of the following protocols are examples of TCP/IP application layer protocols (Choose **TWO (2)** answers.)?

- A. TCP.
- B. HTTP.
- C. IP.
- D. UDP.
- E. SMTP.

**Q12** The process of a web server adding a TCP header to the contents of a web page followed by adding an IP header, and then adding a data link header and trailer is an example of \_\_\_\_\_.

- A. data encapsulation
- B. same-layer interaction
- C. OSI model
- D. frame packaging
- E. frame preparation

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Pengetik Khasanah  
Dr. Shamsul Bahari bin Abdul Kadir



- Q13** Which of the following terms is used specifically to identify a Protocol Data Unit (PDU) at network layer?
- A. Chunk.
  - B. Segment.
  - C. Frame.
  - D. Packet.
  - E. None of the above.
- Q14** Which of the following terms is **NOT** a valid term for the names of the four TCP/IP layers?
- A. Application.
  - B. Data link.
  - C. Network Interface.
  - D. Transport.
  - E. Internet.
- Q15** Which of the following are **TRUE** about Ethernet crossover cables (choose **TWO (2)** answers)?
- A. Pins 1 and 2 are reversed on the other end of the cable.
  - B. Pins 1 and 2 on one end of the cable connect to pins 3 and 6 on the other end of the cable.
  - C. Pins 1 and 2 on one end of the cable connect to pins 3 and 4 on the other end of the cable.
  - D. The cable can be up to 100 meters long to cross over between buildings.
  - E. None of the other answers is correct.
- Q16** Which of the following are **TRUE** about the Carrier Sense Multiple Access with Collision Detection (CSMA/CD) algorithm (choose **TWO (2)** answers)?
- A. The algorithm never allow collisions to occur.
  - B. Collisions can happen, but the algorithm defines how the computers should notice a collision and how to recover.
  - C. The algorithm works with only two devices on the same Ethernet.
  - D. Frames are passed in one-way direction of a closed loop.
  - E. The logical topology is bus.

- Q17** Which of the following is **TRUE** about the Ethernet Frame Check Sequence (FCS) field?
- A. It is used for error detection.
  - B. It is 4 bytes long.
  - C. The polynomials of Ethernet are standardized by IEEE.
  - D. All of the above are correct.
  - E. None of the above is correct.
- Q18** Which of the following are functions of OSI Layer 3 protocols (Choose **TWO (2)** answers.)?
- A. Logical addressing.
  - B. Physical addressing.
  - C. Routing.
  - D. Arbitration.
  - E. Segmentation and De-segmentation.
- Q19** Which of the following is/are valid Class C IP address(es) that can be assigned to hosts?
- A. 255.255.255.0
  - B. 191.1.1.1
  - C. 128.128.128.128
  - D. 224.1.1.1
  - E. 198.200.1.1
- Q20** Each Class B network contains how many IP addresses that can be assigned to hosts?
- A. 65,534.
  - B. 65,532.
  - C. 32,768.
  - D. 32,766.
  - E. None of the above.

(40 marks)

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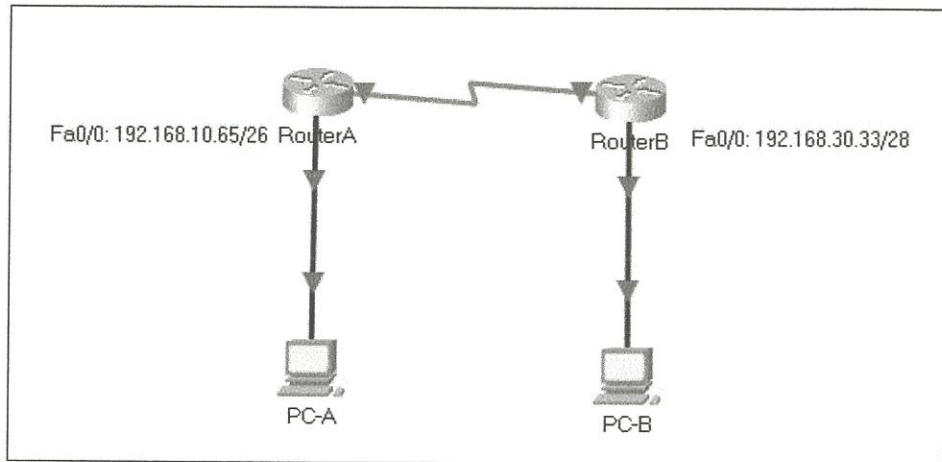
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## SECTION B

- Q21** (a) Given the number of redundancy bits ( $r$ ),  $2^r \geq m + r + 1$ , where  $m$  is the number of data bit,  $r$  is the number of redundancy bits and the bit stream is 1010:
- (i) Calculate the value for  $r$ . (2 marks)
  - (ii) Determine the position of all the redundancy bits. (3 marks)
  - (iii) Calculate the values of these redundancy bits. (3 marks)
  - (iv) What is the final Hamming Code. (2 marks)
- (b) Compare how collision of frames are resolved in CSMA/CD and Token Passing media access controls using suitable diagrams. (9 marks)
- Q22** (a) You receive a task to create a new subnet with two servers. This subnet will be connected to an existing router. The new subnet has been allocated with network address 192.168.20.24/29. The router needs to be assigned with the first usable address and the servers with the last two available host addresses in the subnet.
- (i) What are the servers' IP address and subnet mask? (4 marks)
  - (ii) What is the default gateway address of the server? (2 marks)

(b) Consider the following scenario:



RouterA has an IP address of 192.168.10.65/26 and RouterB has an IP address of 192.168.30.33/28. The routers have been assigned with the first usable address.

Find out the following configurations.

- (i) PC-A IP address (range of possible IP) (2 marks)
  - (ii) PC-A subnet mask (2 marks)
  - (iii) PC-A default gateway (2 marks)
  - (iv) PC-B IP address (range of possible IP) (2 marks)
  - (v) PC-B subnet mask (2 marks)
  - (vi) PC-B default gateway (2 marks)
- (c) Write configuration commands you should perform at RouterA and RouterB using **IOS Commands**. (8 marks)



**Q23** Kayaraya Sdn Bhd is a small software house company based in Kuala Kangsar, Perak. Its office accommodates 50 employees made of four departments which are personnel, finance, marketing, and programmers. The Kayaraya Sdn Bhd network architecture consists of switch(es), Cisco Adaptive Security Appliance (ASA) that act as a firewall, a router and several servers that are web, FTP and email server.

(a) Sketch and label network diagram for Kayaraya Sdn Bhd with Demilitarized Zone (DMZ) accordingly.

(5 marks)

(b) Suggest **FIVE (5)** approaches to mitigate network attack to Kayaraya Sdn Bhd network.

(10 marks)

**- END OF QUESTIONS -**

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