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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2018/2019**

COURSE NAME : COMPUTER NETWORKS  
COURSE CODE : BIC 21303  
PROGRAMME CODE : BIS  
EXAMINATION DATE : JUNE / JULY 2019  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF NINE (9) PAGES

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**TERBUKA**

**SECTION A**

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

- 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 20.20.20.20?
- 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).
- Q4** In the URL <http://www.tupperware.com/ws.html>, which part identifies the web server?
- A. http
  - B. www.tupperware.com
  - C. tupperware.com
  - D. http://www.tupperware.com
  - E. The file ws.html includes the hostname.

- 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 Unshielded Twisted Pair?
- A. 1000BaseSX.
  - B. 1000BaseCX.
  - C. 1000BaseT.
  - D. None of the above.
- Q7** Which standardization organization is responsible for the 802.5 standard?
- A. The International Standards Organization (ISO).
  - B. The International Telecommunications Union (ITU).
  - C. The Institute of Electrical and Electronics Engineers (IEEE).
  - D. 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.
- Q9** Which of the following is **NOT** a network architecture?
- A. Open System Interconnection.
  - B. TCP/IP.
  - C. AppleTalk.
  - D. Ethernet.

- 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. All of the above.
- Q11** Which of the following protocols are examples of TCP/IP application layer protocols? (Choose two answers.)
- A. Ethernet
  - B. HTTP
  - C. IP
  - D. UDP
  - E. SMTP
  - F. TCP
- 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 what?
- A. Data encapsulation.
  - B. Same-layer interaction.
  - C. OSI model.
  - D. Packaging.
  - E. All of these answers are correct.
- Q13** Which of the following terms is used specifically to identify a Protocol Data Unit (PDU) at network layer?
- A. Data.
  - B. Chunk.
  - C. Segment.
  - D. Frame.
  - E. Packet.
  - F. 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)?

- 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 token passing algorithm (choose three)?

- A. The algorithm never allows 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 ring.

**Q17** Which of the following is **TRUE** about the Ethernet 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 answers.)

- A. Logical addressing.
- B. Physical addressing.
- C. Routing.
- D. Arbitration.
- E. Segmentation and Desegmentation.

**Q19** Which of the following are valid Class C IP addresses that can be assigned to hosts?

- A. 255.255.255.0
- B. 190.1.1.1
- 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. 256
- F. 254

(40 marks)

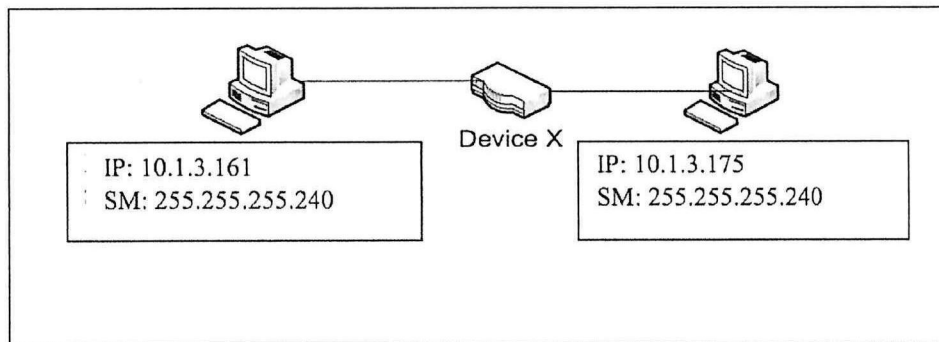
**SECTION B**

**Q21 (a)** A packet switch has five users, each offering packets at a rate of 10pps. The average length of the packets is 1024 bits. The packet switch needs to transmit this data over a 56 kbps WAN circuit.

(i) Calculate network load, utilization and average number of packets in the queue (Queue Depth). (6 marks)

(ii) Determine if the WAN circuit need an upgrade or not. (3 marks)

(b) Consider the following diagram:



**FIGURE Q21**

(i) How many subnets exist in the above network diagram? List all of them. (Show your work.) (4 marks)

(ii) Assuming pinging from Computer A to Computer B is successful, what is Device X and state why? (4 marks)

(c) Consider the following scenario:

UTHM has installed a web application called SMAP for its students. After collecting the response time for the SMAP Web application it was averaged at 112 ms.

Is this response time reasonably good? State your reasoning. (3 marks)

**Q22** Given the following scenario:

Happy Network Sdn Bhd has hired you to advice on their new high speed enterprise network. After interviewing its IT Head, Dr. Zhou Bai Lee, 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: Batu Pahat

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 Happy Networks Sdn Bhd. (3 marks)
  
- (b) Specify and justify suitable transmission media for all parts of the network. (Use the diagram you have sketched in **Q22(a)**). (5 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 which department

(10 marks)

(d) Using your table in Q22(c), generate address configurations for the following devices:

- (i) all routers

(4 marks)

- (ii) all servers

(6 marks)

(e) Using **IOS Commands**, write configuration commands you should perform at the following network devices:

- i) on all routers

(8 marks)

- ii) on one switch (choose any).

(4 marks)

**- END OF QUESTIONS -**