STIJ3023 CONFIDENTIAL

UNIVERSITI UTARA MALAYSIA

FINAL EXAM
SECOND SEMESTER SESSION 2011/2012

COURSE CODE / NAME : STIJ3023 COMPUTER NETWORK
DATE : 14 JUNE 2012 (THURSDAY)
TIME : 2.30 – 5.00 P.M. (2 1/2 HOURS)
VENUE : BK3 (FWB), KIA

INSTRUCTION :
1. This exam paper contains FIFTEEN (15) structured questions in NINE (9) printed pages, excluding the cover page.
2. Answer ALL QUESTIONS on the spaces provided.
3. You are NOT ALLOWED to remove the exam paper from the examination hall.

MATRIC NO : ____________________________  \( \text{(with number)} \)
IDENTIFICATION CARD NO. :
LECTURER : ______________________________
GROUP : \( \square \)  TABLE NO. : \( \square \)  

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

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STRUCTURED QUESTIONS (100 MARKS)

INSTRUCTION: Answer ALL questions in the space provided.

1. Define the following terms:
   a) Internet
   b) User Agent
   c) Virtual-circuit Networks
   d) Socket
   e) Routing Protocols

(10 marks)
2. List the **FIVE (5)** layers of Internet Protocol Stacks in the correct order, and identify the principle responsibilities for each of these layers.

(10 marks)

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<th>Layers</th>
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3. List **FOUR (4)** Application Layer Protocols, and describe each of them briefly.

(8 marks)
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4. Port numbers are 16 bit integer numbers which are ranging from 0 to 65535
   a) Explain the importance of port numbers?  
      
      (2 marks)

   b) Internet Assigned Number Authority (IANA) has divided the port numbers into three ranges. Briefly list these THREE (3) ranges’ names and their port numbers.
      
      (3 marks)

5. Write down the THREE (3) steps involved in the connection establishment process in Transmission Control Protocol (TCP), which is called as a three-way handshaking.

      (6 marks)
6. Differentiate between each pair of the following:
   a) Circuit Switching versus Packet Switching
   b) SMTP versus POP3
   c) TCP versus UDP
   d) Unicast versus Multicast
   e) Passive Intruder versus Active Intruder

   (10 marks)
7. Wireless LAN can be operated in two modes. State these **TWO (2)** modes and explain briefly. 
(4 marks)

8. IPv6 is the new standard protocol proposed to overcome the deficiencies of IPv4. However, there will be no flag day where all IPv4 device and configuration cease to operate and replaced by all IPv6 devices and configuration.

   a) List and explain briefly **TWO (2)** transitional methods that could be done so that IPv6 can be implemented without affecting the still functioning IPv4 network. 
(4 marks)

   b) Simplify the following IPv6 address into the simplest form possible:

   i. 2001:0000:0000:1234:0001:0002:abcd:ab12 
(1 mark)

(1 mark)
9. What is the significance of CRC field in the MAC frame? (2 marks)

10. Describe in details the CSMA/CD algorithm. (5 marks)

11. Multimedia application can be transmitted over the network using streaming and real-time transmission.
    a) What is meant by interactivity for streaming stored audio/video? (2 marks)
bj What is meant by interactivity for real-time interactive audio/video?

12. Internet traffic can be grouped into classes so that it can be given different type of services. The packets that belong to different classes and various network flows are multiplexed and queued for transmission at the output buffer associated with a link. The manner in which queued packets are selected for transmission on the link is known as the link-scheduling discipline. List THREE (3) scheduling disciplines and describe it briefly.

(2 marks)
13. Identify **FOUR (4)** desirable properties of *Secure Communication*. Then briefly explain each of them. (8 marks)

14. List and describe briefly **THREE (3)** common security attacks. (6 marks)
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15. Name and explain briefly the FiVE (5) areas of network management defined by the International Standard Organization (ISO).

(10 marks)

END OF QUESTIONS