UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019

COURSE NAME	:	COMPUTER NETWORKS
COURSE CODE	:	BEC41003
PROGRAMME CODE	:	BEJ
EXAMINATION DATE	:	DECEMBER 2018/JANUARY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS IN THIS QUESTION BOOKLET

THIS QUESTION PAPER CONSISTS OF **ELEVEN (11)** PAGES

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SECTION A (OBJECTIVE QUESTIONS)

Q1   What is the access point in wireless LAN?
      i.   wireless devices itself
      ii.   device that allows wireless devices to connect to a wired network
      iii.   device that will forward packets toward their ultimate destinations
      iv.   device that provides search results, e-mail, Web pages, and videos

(a) ii
(b) iii
(c) i and iii
(d) ii and iv

(2 marks)

Q2   Which of the following layer is not in OSI layer?
(a) Physical layer
(b) Network layer
(c) Internet layer
(d) Transport layer

(1 mark)

Q3   What is the use of Bridge in Network?
(a) to connect LANs
(b) to separate LANs
(c) to control Network Speed
(d) All of the above

(1 mark)

Q4   Website uses this application layer protocol
(a) SIP
(b) FTP
(c) HTTP
(d) SMTP

(1 mark)

Q5   Which layer provides the services to user?
(a) Session layer
(b) Application layer
(c) Presentation layer
(d) None of the mentioned

(1 mark)

Q6   Which layer do the data link layer takes the packets from and encapsulates them into frames for transmission?
(a) Physical layer
(b) Network layer
(c) Transport layer
(d) Application layer

(1 mark)

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Q7   Application layer protocol defines
- i.   types of messages exchanged
- ii.   host-to-host communication service.
- iii.   message format, syntax and semantics
- iv.   rules for when and how processes send and respond to messages

(a) i, ii, and iii
(b) i, ii, and iv
(c) i, iii, and iv
(d) ii, iii, and iv

(2 marks)

Q8   Which layer will link the Network Support Layers with User Support Layers
(a) session layer
(b) network layer
(c) data link layer
(d) transport layer

(1 mark)

Q9   In virtual circuit network, each packet contains
- i.   a long VC number
- ii.   full source address
- iii.   a short VC number
- iv.   full destination address

(a) i
(b) iii
(c) i, ii, and iv
(d) ii, iii, and iv

(2 marks)

Q10   The underlying Transport layer protocol used by SMTP is
- i.   FTP
- ii.   TCP
- iii.   UDP

(a) i
(b) ii
(c) i and iii
(d) ii and iii

(2 marks)

Q11   User datagram protocol is called connectionless because _____.
(a) it sends data as a stream of related packets
(b) all UDP packets are treated independently by transport layer
(c) it specifies the format of the packets that are received among routers
(d) None of the mentioned

(1 mark)

Q12 TCP process may not write and read data at the same speed. So, we need _____ for storage.
(a) packets
(b) buffers
(c) segments
(d) stacks

(1 mark)

Q13 Suppose a TCP connection is transferring a file of 1000 byte. The first byte is numbered 10001. What is the sequence number of the segment if all data is sent in only one segment?
(a) 10000
(b) 10001
(c) 12001
(d) 11001

(1 mark)

Q14 ICMP is primarily used for
    i. addressing
    ii. forwarding
    iii. error and diagnostic functions

(a) ii
(b) iii
(c) i and ii
(d) i and iii

(2 marks)

Q15 The 4 bytes IP address consists of
    i. host address
    ii. network address
    iii. universal address
    iv. subnet mask address

(a) i and ii
(b) i and iv
(c) ii and iii
(d) iii and iv

(2 marks)

Q16 Which address is used in Internet for employing the TCP/IP protocols?
    i. port address
    ii. logical address
    iii. specific address
    iv. physical address

(a) i, ii, and iii
(b) i, iii, and iv
(c) ii, iii, and iv
(d) i, ii, iii, and iv

(2 marks)

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Q17   IPSec is designed to provide the security at the _____.
     (a) session layer
     (b) network layer
     (c) transport layer
     (d) application layer

(1 mark)

Q18   In the version field of IPv4 header, when the machine is using some other version of IPv4 then the datagram is _____.
     (a) accepted
     (b) discarded
     (c) interpreted
     (d) interpreted incorrectly

(1 mark)

Q19   Which one of the following task is not done by data link layer?
     (a) Framing
     (b) Flow control
     (c) Error control
     (d) Channel coding

(1 mark)

Q20   The network layer at the source is responsible for creating a packet from the data coming from another _____.
     (a) link
     (b) node
     (c) protocol
     (d) station

(1 mark)

Q21   Which sublayer of the data link layer performs data link functions that depend upon the type of medium?
     (a) logical link control sublayer
     (b) media access control sublayer
     (c) network interface control sublayer
     (d) None of the mentioned

(1 mark)

Q22   Outline the correct component(s) that belongs to data link protocol?
     i.   HDLC
     ii.   ethernet
     iii. point to point protocol

     (a) i and ii
     (b) i and iii
     (c) ii and iii
     (d) i, ii and iii

(2 marks)

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Q23 Automatic repeat request error management mechanism is provided by _____.
(a) logical link control sublayer
(b) media access control sublayer
(c) network interface control sublayer
(d) None of the mentioned

(1 mark)

Q24 Which multiple access technique is used by IEEE 802.11 standard for wireless LAN?
(a) CDMA
(b) ALOHA
(c) CSMA/CA
(d) None of the mentioned

(1 mark)

Q25 The _____ layer provides a well-defined service interface to the network layer, determining how the bits of the physical layer are grouped into frames.
(a) data link
(b) physical
(c) network
(d) session

(1 mark)

Q26 A wireless network interface controller can work in
  i.   demo mode
  ii.   ad-hoc mode
  iii. supervisor mode
  iv.   infrastructure mode

(a) ii and iv
(b) iii and iv
(c) i, ii, and iii
(d) ii, iii, and iv

(2 marks)

Q27 State True or False for the following characteristics of optical fiber cables.
  i.   The cost of fiber optic cable is more compared to twisted pair and co-axial.
  ii. The installation of fiber optic cable is much easier.

(a) i-True, ii-True
(b) i-False, ii-True
(c) i-True, ii-False
(d) i-False, ii-False

(2 marks)

Q28 The physical layer concerns with _____.
(a) bit-by-bit delivery
(b) process to process delivery
(c) application to application delivery
(d) none of the mentioned

(1 mark)

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Q29   Which transmission media has the highest transmission speed in a network?
(a) coaxial cable
(b) electrical cable
(c) optical fiber
(d) twisted pair cable

(1 mark)

Q30   The physical layer translates logical communication requests from the _____ into hardware specific operations.
(a) application layer
(b) data link layer
(c) network layer
(d) transport layer

(1 mark)

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SECTION B (SUBJECTIVE QUESTIONS)

Q31 (a) Consider sending a packet from a source host to a destination host over a fixed route. List the delay components in the end-to-end delay. Identify the constant delay(s) and variable delay(s)?

(4 marks)

(b) Suppose Andy and Brian are sending packets to each other over a computer network. Suppose Sam positions himself in the network so that he can capture all the packets sent by Andy and send whatever he wants to Brian; he can also capture all the packets sent by Brian and send whatever he wants to Andy. Speculate the **four (4)** malicious things Sam can do from this position?

(8 marks)

Q32 (a) Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Elaborate your answer.

(6 marks)

(b) From a user's perspective, determine the difference between the download-and-delete mode and the download-and-keep mode in POP3?

(8 marks)

Q33 UDP and TCP use 1's complement for their checksums. Suppose you have the following three 8-bit bytes:

01010011   01100110   01110100

(a) Identify the 1's complement of the sum of these 8-bit bytes? Show all work.

(6 marks)

(b) Reason why UDP takes the 1's complement of the sum instead of using the sum?

(2 marks)

(c) With the 1's complement scheme, how does the receiver detect errors?

(2 marks)

(d) Is it possible that a 1-bit error will go undetected?
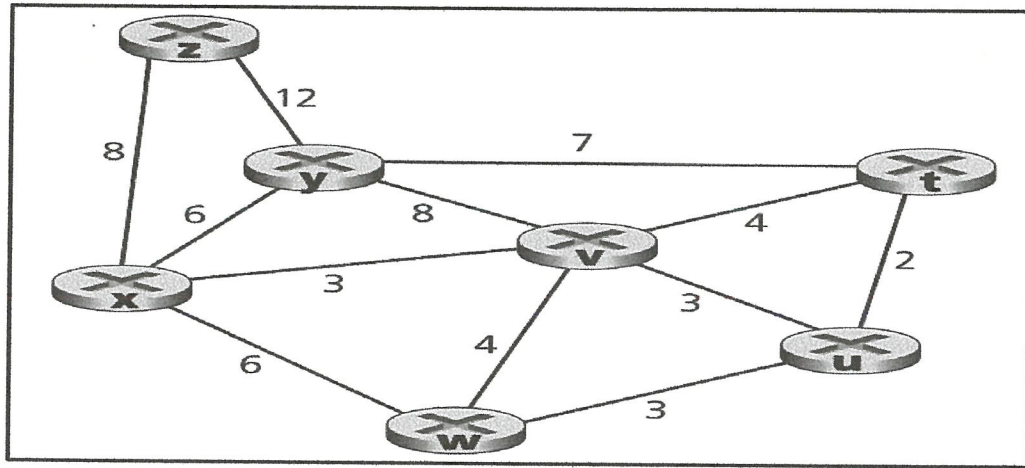
(1 mark)

Q34

Figure Q34

Consider the network shown in **Figure Q34**. With the indicated link costs, use Dijkstra's shortest-path algorithm to:

(a) Compute the shortest path from *x* to all network nodes. Show how the algorithm works by using appropriate table.

(7 marks)

(b) Repeat question Q34(a) for node *y* to all network nodes.

(7 marks)

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Q35 Suppose there are two ISPs providing Wi-Fi access in a coffee house, with each ISP operating its own AP and having its own IP address block.

(a) Further suppose that by accident, each ISP has configured its AP to operate over channel 11.

(i) Will the 802.11n (with the speed of 600 Mbps) protocol completely break down in this situation? Explain your answer.

(5 marks)

(ii) Discuss what happens when two stations, each associated with a different ISP, attempt to transmit at the same time.

(2 marks)

(b) Now suppose that one AP operates over channel 1 and the other over channel 11. How do your answers change?

(2 marks)