

KABARAK



UNIVERSITY

UNIVERSITY EXAMINATIONS

2010/2011 ACADEMIC YEAR

FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE

COURSE CODE: COMP 461

COURSE TITLE: INTERNETWORKING WITH TCP/IP

STREAM: Y4S2

DAY: WEDNESDAY

TIME: 9:00 –11:00A.M.

DATE: 08/12/2010

INSTRUCTIONS

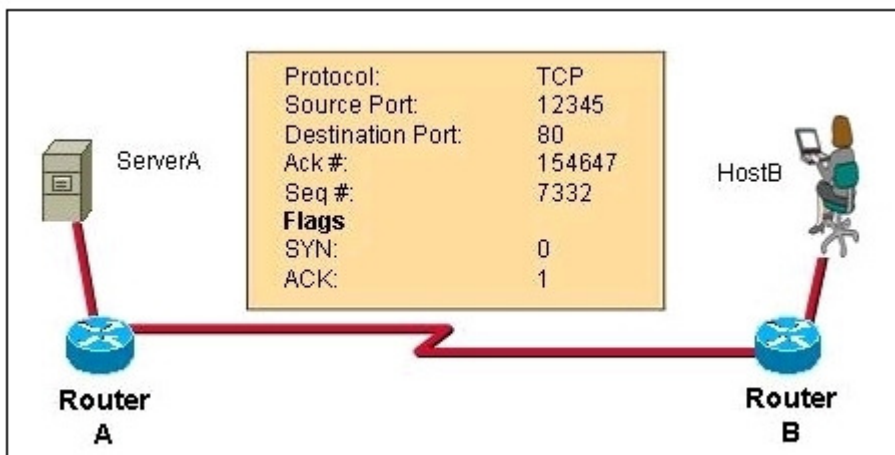
- Answer **ALL** questions in section A and any **TWO** questions in section **B**
- All questions in section B carry equal marks

PLEASE TURN OVER

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

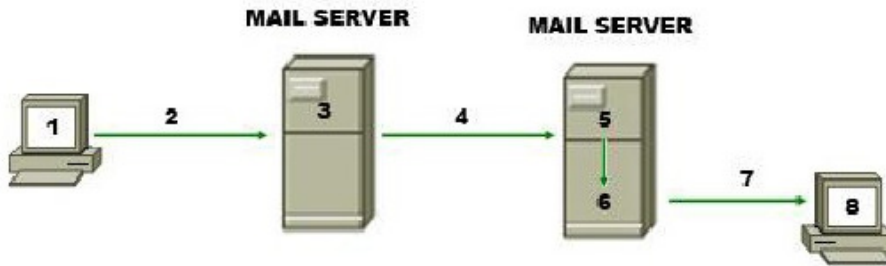
- a) Which two statements concerning networking standards and protocols are true? (Choose two.) [2 marks]
- a) Adds complexity to networks encourages vendors to create proprietary protocols
 - b) provides consistent interconnections across networks
 - c) Ensures that communications work best in a single-vendor environment
 - d) simplifies new product development
- b)
- i). State the OSI layer that offers reliable, connection-oriented data communication services and identify the protocol responsible for this service [2 marks]
 - ii). Other than the service stated above outline THREE other services offered by the protocol identified in b(i) above [3 marks]
- c)
- i). Which two functions of the OSI model occur at layer two? (Choose two.) and state the protocols responsible for each choice [4 marks]
- a) physical addressing
 - b) encoding
 - c) routing
 - d) cabling
 - e) media access control



- ii). Refer to the exhibit. What two facts can be determined from the information that is given? (Choose two.) **[2 marks]**
- The source port indicates that a Telnet session has been initiated.
 - The data is flowing from server to client.
 - The destination port indicates that an HTTP session has been initiated.
 - The data listed is associated with the transport layer.
 - The source port does not support communication with the destination port that is listed.

Partial Layer 4 Header			
Bit 0		Bit 16	Bit 31
Source Port	13357	Destination Port	23
Sequence Number	3001		
Header Length, Reserved, Code Bits		Window	1500

- iii). Refer to the exhibit above. Which two statements describe the information that is represented in the header? (Choose two.) **[2 marks]**
- This is a server response.
 - The UDP protocol is being used.
 - The destination port indicates a Telnet session.
 - The return segment will contain a source port of 23.
 - The next session originated from the client of this session will use the source port number 13358.



Refer to the exhibit. The diagram represents the process of sending e-mail between clients. Identify the protocol and /or mail handling programs used at each numbered stage of the diagram and state its function **[8 marks]**

- d) State the protocols responsible for the following functionalities in data communication networks. **[1 mark]**
- Providing connections over regular telephone lines using modems on both ends
 - Providing remote logins.

- e) State with reasons the protocol that you would install in a network to fulfill each of the following tasks **[6 marks]**
- i). A protocol that Allow users to communicate over the internet
 - ii). A protocol requiring minimal configuration to enable communication within the workgroup
 - iii). A protocol that enables highs peed transmission of large amounts of audio, video and data files simultaneously over a network

SECTION B: each Question is worth 20 Marks Answer Any TWO Questions

QUESTION TWO (20 MARKS)

- a)
- i). Outline the THREE parameters used in the IEEE naming convention for Ethernet standards **[3 marks]**
 - ii). In view of the naming convention standards explain the meaning of 100BaseT Ethernet **[3 marks]**
 - iii). Distinguish between fast Ethernet and gigabit Ethernet **[2 marks]**
 - iv). Ethernet has survived the test of time as the major LAN technology Outline FOUR characteristics of Ethernet standard that has contributed to this dominance. **[4 marks]**
- a) Link layer protocols can provide reliable or unreliable service. Why would one ever design a protocol a protocol to provide unreliable service? Given an example, other than a reliable physical layer of an application where a reliable data link layer would be a poor choice. **[5 marks]**

QUESTION THREE (20 MARKS)

- a) State the protocols responsible for the following functions
- i). Allow a remote user to log on to the system and run console programs by using the command line
 - ii). Define the way files are attached to SMTP messages
- b) What information can be gathered by using the command netstat? (Choose two) **[2 marks]**
- a. the default gateway
 - b. the routing protocol
 - c. active TCP connections
 - d. the locally configured subnet mask
 - e. active UDP connections

- c) Outline THREE aims of FTP protocol is to [3 marks]
d)
- i). State the protocols involved to boot remote computers over a network. [3 marks]
ii). Explain what happens when a remote client boots Clearly outlining how the protocols listed above are involved [10 marks]

QUESTION FOUR (20 MARKS)

- a) State three characteristics of CSMA/CD [3 marks]
- b) What is Time Division Multiplexing (TDM)? Explain how it works. Feel free to use a drawing to illustrate your answer. [3 marks]
- c) i) What is Statistical Multiplexing, a.k.a. broadcasting and how does it work? [3 marks]
ii) Outline the shortcoming of statistical Multiplexing. [2 marks]
iii) Under what circumstances is Statistical Multiplexing preferable to static multiplexing techniques? [3 marks]
- d) Consider a real-time network such as a one that is of a manufacturing process or a chemical process. Assume that the network must carry regularly scheduled time-sensitive commands and measurements between physical devices and the computerized control system. Would a networking technology based on TDM be more or less desirable than one based on CSMA/CD? Why? [5 marks]

QUESTION FIVE (20 MARKS)

- a)
- i). Outline the role of a network access server (NAS) in a traditional remote access scenario. [2 marks]
- ii). Explain how the services offered by the network access server in a traditional access scenario are achieved by L2TP [4 marks]
- iii). Outline the advantage of the L2TP approach to remote connectivity over other remote access technologies [2 marks]
- iv). Explain why security is an issue in L2TP [2 marks]
- b)
- i). what is meant by a Virtual Private Network (VPN) [2 marks]
ii). Outline the meaning of a tunnel as applied in internetworking protocols [3 marks]
iii). Explain the process of building a VPN using Layer 2 Tunneling Protocol(L2TP) [3 marks]
iv). What additional functionality does IPSec offer on L2TP implementation[2 marks]