United International University
Department of Computer Science and Engineering
CSE 4509/CSI 309: Operating System Concepts/Operating Systems
Mid-term Examination: Spring 2023
Time: 1 hour and 45 minutes

United International **University (UIU)**
Dept. of Computer Science and Engineering (CSE)
MidTerm Assessment   Year: **2023**   Semester: **Spring**
Course: **CSE 323**   Title: **Computer Networks (Section – All)**
Marks: **30**   Time: **1 Hour 45 minutes**

[Any examinee found adopting unfair means will be expelled from the trimester/program as per UIU disciplinary rules.]

There are **Three (03)** questions. Answer **all questions**. All questions are of values indicated on the right-hand margin.

Q1.

a) Why do you call Internet "a network of networks"?   [2]

b) Between circuit-switching and packet-switching technologies which one you prefer if you prioritize
(i) fastest delivery or (ii) reliable delivery? Justify your selection.   [2]

c) Why packet switching is called a store-and-forward method? Explain this with an example of a caravan of several cars that crosses through a toll booth.   [2]

d) Draw all the layers of TCP/IP protocol suite. Copy this table on your answer script and then complete it.   [3]

Protocol/functionalities	Implemented in (put a $\sqrt{}$ if yes)			Belongs to which TCP/IP Layer
	End host	Router	Switch	
PIM-SM routing protocol				
DNS				
UDP				
HTTP				
WLAN				

e) Suppose Host A is sending a message of length 400 Kbyte to Host B. Bandwidths of two segments are $R1 = R2 = 1$ Mbps. Distances of two segments are $D1 = 2$ km and $D2 = 0.5$ km respectively. If 2×10^8 ms^{-1} is the propagation speed in medium, find out the end-to-end delay from A to B while processing and queuing delays inside the router is 5 msec and 10 msec respectively.   [3]
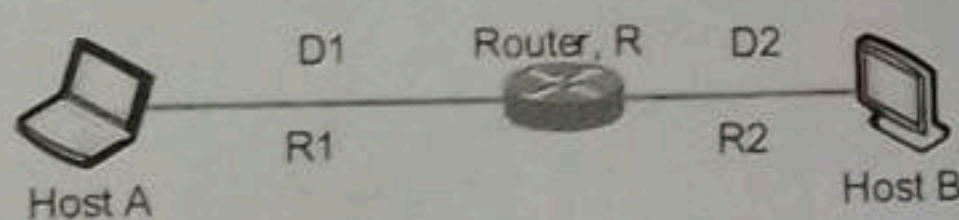
Q2.

a) What information is used by a process running on one host to identify a process running on another host?   [1]

b) Consider an e-commerce site that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies.   [2]

c) What is the difference between persistent HTTP and non-persistent HTTP?
Suppose that a website is composed of 10 embedded image objects including a base HTML file, the images and base file are small enough to fit in one TCP segment. Now, calculate how many RTT are required to retrieve base file and images under-following condition :
(i)   non-persistent connection.
(ii)   persistent connection.   [1 + 3]

d) Suppose Alice, with a Web-based e-mail account (such as Hotmail or Gmail), sends a message to Bob, who accesses his mail from his mail server using IMAP. Discuss how the message gets from Alice's host to Bob's host. Be

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e 3 questions. Numbers to the right of the questions denote their marks.

memory configurations in Figure-1. Two processes with lengths 5 and 2 arrive consecutively. Show
process with the following strategies: [2+2]

y cc

t.

t.

d) Suppose Alice, with a Web-based e-mail account (such as Hotmail or Gmail), sends a message to Bob, who accesses his mail from his mail server using IMAP. Discuss how the message gets from Alice's host to Bob's host. Be sure to list the series of application-layer protocols that are used to move the message between the two hosts.

[3]

e) Suppose that host at **cse.uiu.ac.bd** wants IP address for **cse.buet.ac.bd**. Describe the iterated query.   [2]

Q3.

Suppose that a process running with port 61 is using a UDP segment is to send the following 2 bits (bytes) to another process with port 53.

$$0101\ 1010\ 0111\ 0001$$

Now answer the following questions:

i.   What will be length (in bytes) of the UDP segment that will be sent from the transport layer?
[1.5]

ii. What fields are contained in the headers of a UDP segment? How big are each of these fields?
[1.5]

iii. Calculate the checksum for the UDP segment. *The checksum of a UDP segment is 2 bytes long (having values between 0 and 65535), and it is calculated over the entire UDP segment, including the UDP headers and the data payload.*   [1.5]

iv. What will be the values of each of the fields of the header of the UDP segment that is being sent in the given scenario?   [1.5]

End of Paper – Thank You