

National University of Computer and Emerging Sciences, Lahore Campus



Course:	Computer Networks	Course Code:	CS-3001
Program:	BS (Computer Science)	Semester:	Fall 2023
Duration:	30 Minutes	Total Marks:	20
Paper Date:	20-Sep-2023	Weight	2.5%
Section:	BCS (5B)	Page(s):	2
Exam:	Quiz 2	Roll No.	

Name & Section:

Attempt all questions on the question booklet. Rough sheets can be used but it should not be attached. State your answers in readable handwriting and with the help of diagrams, where necessary. Cutting / over-writing is strictly prohibited and will result in zero mark in MCQs.

Question # 1:

[5 marks, CLO # 2]

Choose the correct option.

1. With P2P file sharing, the peer that is uploading the file is labeled as:

- (a) Client
- (b) Server
- (c) Both a and b
- (d) None of the given option

2. HTTP uses _____ connections in its default mode.

- (a) Persistent
- (b) Non-Persistent
- (c) Both a and b
- (d) None of the given option

3. DNS runs over _____ and uses port _____.

- (a) TCP; 23
- (b) UDP; 23
- (c) TCP; 53
- (d) UDP; 53

4. True or False? TCP provides encryption whereas UDP does not.

- (a) True
- (b) False

5. True or False? Cookies are stored on server side on behalf of the client.

- (a) True
- (b) False

Question # 2:

[2 marks, CLO # 2]

Why do HTTP, SMTP, and IMAP run on top of TCP rather than on UDP?

The applications associated with those protocols require that all application data be received in the correct order and without gaps. TCP provides this service whereas UDP does not.

Question # 3:

[3 marks, CLO # 2]

Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why?

Web caching can bring the desired content “closer” to the user, possibly to the same LAN to which the user’s host is connected. Web caching can reduce the delay for all objects, even objects that are not cached, since caching reduces the traffic on links.

Question # 4:

[2 + 4 + 4 marks, CLO # 2]

An Internet user located in Lahore requests a 125 KB web page from a server located in Islamabad. The received page references 5 image files, 250 KB each. User is connected to the Internet via a 10 Mbps access link. Assume that it takes 50 ms for a small HTTP message to travel from client to server (and vice versa). Also assume that user's access link is the connection bottleneck.

a) What is RTT? Calculate the value of RTT in this above connection.

RTT is the time taken by a small packet to go from client to server and back from server to client.

$$\text{RTT} = 50\text{ms} + 50\text{ms} = 100\text{ms} = 0.1 \text{ sec}$$

b) Calculate the total time taken for the web page (including image files) to display on user's screen if non-persistent HTTP is used with one connection at a time (ignore processing delays)

$$\text{Web page: } (2 \times 100 \text{ ms}) + (125 \times 8 \times 1000 / 10000000) = 300 \text{ ms}$$

$$\text{Image files: } 5 \times [(2 \times 100 \text{ ms}) + (250 \times 8 \times 1000 / 10000000)] = 2000 \text{ ms}$$

$$\text{Total time} = 2.3 \text{ seconds}$$

c) How long would it take to display the same web page with persistent HTTP (single connection)?

$$\text{Web page: } (2 \times 100 \text{ ms}) + (125 \times 8 \times 1000 / 10000000) = 300 \text{ ms}$$

$$\text{Image files: } 100 \text{ ms} + (5 \times 250 \times 8 \times 1000 / 10000000) = 1100 \text{ ms}$$

$$\text{Total time} = 1.4 \text{ seconds}$$