

## National University of Computer and Emerging Sciences LHR



Course	CN Lab	Course Code	CL3001
Program	BS CS	Semester	Fall 2023
Duration	2 hr 30 min	Total Marks	50
Date	24/Oct/2023	Weightage	25%
Section	5E1 & E2	Total Parts	3 parts
Student Name		Student Roll #	
<p>Xeon Submission (mandatory)</p> <p>Then submit on GCL also.</p>	<p><b>\\cactus1\Xeon\Fall 2023\CN Lab Mid\5E Exam</b></p> <p><b>File NAME: ROLL#_SEC_NAME</b></p> <p>Submit all files, input files you use, compiled word file with answers and screenshots and .c files as well.</p>		

### Rules:

- Understanding the question statement is also part of the exam, so **do not ask any questions** whatsoever. In case of any ambiguity, make suitable assumptions.
- You have to complete the exam in 2 hours and 30 minutes including the submissions, no late submissions will be acceptable whatsoever.
- Midterm exam **helping materials are placed on your Google classroom.**
- **Rename your submission folder to your Roll number in the format 20L-XXXX**, by putting your roll number. Submission path is your google classroom. Folder has already been created for this purpose.
- Your code should be indented and commented properly. Use meaningful variable names. Failure to comply will result in marks deduction. **Submit screenshots where suitable.**

- Any kind of cheat sheet/code if found in your PC will result in immediate disqualification from midterm exam and 'F' as final grade in Computer Networks Lab. So, make sure you delete everything from Desktop of your windows as well as Ubuntu. Also delete all the files permanently from Recycle Bin and Trash respectively for Windows and Ubuntu. Delete all files from your Z Drives before starting the exam.

- **If any student is found browsing any website, his/her exam will be CANCELLED IMMEDIATELY.**

- INTERNET USAGE IS ONLY ALLOWED TO MAKE SUBMISSION ON GOOGLE CLASSROOM.

- It is your responsibility to save your code from being copied. All matching codes will be considered cheating cases. **PLAGIARISM will result in forwarding of case to Disciplinary Committee.**

- In case of missing or corrupted submission, ZERO marks will be awarded.

- You are immediately disqualified from the exam if:

- i. You are seen talking, whispering, borrowing or looking at someone's PC.

- ii. A USB is found attached to your PC.

- iii. You are seen using cell phone/smart watch.

- iv. You are caught accessing internet.

## Objective: [1x10 Marks]

Instructions: Select and **BOLD+HIGHLIGHT** the answer part.

Example: This is a CN Lab mid?

A. **Yes**

B.No

1. In TCP socket programming, what function is used to establish a connection with a remote server?

A. connect()

B. bind()

C. accept()

D. listen()

2. Which layer of the OSI model is primarily responsible for routing and forwarding packets?

A. Network Layer

B. Transport Layer

C. Data Link Layer

D. Application Layer

3. What is the primary purpose of Wireshark in computer networking?

- A. Network configuration
- B. Network encryption
- C. Network monitoring and packet analysis
- D. Network simulation

4. In UDP socket programming, which function is used to send data over a socket?

- A. write()
- B. send()
- C. recvfrom()
- D. connect()

5. What does the fseek() function in C file management allow you to do?

- A. Close a file
- B. Read data from a file
- C. Move the file pointer to a specified location within the file
- D. Create a new file

6. Which function is used to create a TCP socket in C?

- A. socket()
- B. create\_socket()
- C. open\_socket()
- D. tcp\_socket()

7. What is the key difference between TCP and UDP socket programming?

- A. TCP is connectionless, while UDP is connection-oriented.
- B. UDP is connectionless, while TCP is connection-oriented.
- C. Both TCP and UDP are connectionless.
- D. Both TCP and UDP are connection-oriented.

8. In C programming, which function is used to open a file for reading and writing?

- A. open\_file()
- B. read\_file()
- C. fopen()
- D. open()

9. When using Wireshark, which type of network traffic does it capture and analyze?

- A. Only encrypted traffic
- B. Only local network traffic
- C. All traffic passing through the network interface
- D. Only traffic from web browsers

10. Which function is used to close a file in C after reading or writing operations?

- A. close()
- B. fclose()
- C. file\_close()
- D. end\_file()

## Tasks:

### Task 1: [20 marks]

Use the http-ethereal-trace-3 packet trace to answer the questions below and apply the relevant filter

Answer the following questions:

1. How many HTTP GET request messages did your browser send?

Screenshot+Answer:

2. Which packet number in the trace contains the GET message for The Bill of Rights?

Screenshot+Answer:

3. Which packet number in the trace contains the status code and phrase associated with the response to the HTTP GET request?

Screenshot+Answer:

4. What is the status code and phrase in the response?

Screenshot+Answer:

5. How many data-containing TCP segments were needed to carry the single HTTP response and the text of the Bill of Rights? What are the numbers of those packets?

Screenshot+Answer:

### Task 2: [20 marks]

Create a TCP client and server application for a simple chat program. The client and server should allow users to send and receive text messages to and from one another.

Requirements:

1. The server should be able to accept multiple client connections simultaneously.
2. Clients should be able to connect to the server and send text messages.
3. The server should relay messages from one client to all other connected clients.
4. Clients should display received messages on their screens.

Sample Test Bench:

- Client A connects to the server and sends a message: "Hello, anyone there?"
- Client B connects to the server and sends a message: "Yes, I'm here!"
- The server relays Client A's message to Client B.
- The server relays Client B's message to Client A.

Make sure to handle disconnections gracefully and provide a clear indication of which client sent each message

Screenshots + Code/Answer: