CSE421
Lab 02 Hometask
Summer 2023

1. **How would a proxy server check to see if its data is up to date with the most updated data in the Origin Server?**

   The proxy server gives a header request to the original server. If the last modified date in the web cache of the proxy server and the origin server are the same then no modification occurred. Thus, the origin server responds with the status quote 304 meaning that the data is not modified. But if the last modified dates don't match, then the origin server gives a response with the status quote 200 and the new data. Then the proxy server updates its existing file with the given update

2. **The HTTP protocol is implemented in the Physical layer. Is this statement true or false?**

   False.

   HTTP protocol is implemented in the application layer.

3. **Can you receive mail using SMTP, why or why not?**

   NO.

   SMTP is a push protocol which is used for sending emails.

4. **Briefly explain how SMTP and POP3 protocol works using a scenario.**

   Say, PC1 wants to send a mail to PC2. So, when pc1 sends the mail it goes to its SMTP server which gets transferred to PC2's SMTP server. Now, when PC2 clicks receive on its end, the pop3 protocol is used to retrieve the mail from its mail server.

5. **Why do root DNS servers maintain a hierarchical structure rather than a centralized structure?**

   Due to single point failure. So, if one DNS fails, the entire system fails.

6. **Suppose, you have a quiz which will take place at bux but your local DNS server does not know the IP address of "bux.bracu.ac.bd". Will you be able to attend your quiz? Please, provide a brief explanation.**

   Yes!

   But in this case, the local DNS server will request the origin server. And after it gets the IP it will store it for future retrievals.

7. **Suppose, you recently changed your ISP and the new ISP forgot to set the DNS server's IP address when configuring your internet connection. Can you now browse the internet correctly?**
NO…
The PC needs the IP address of the local DNS in order to map the IP address of the URL searched. Moreover, the root DNS can not also be accessed as the local DNS cant be accessed.

8. **What is the size of an ARP request or reply packet (in bytes)?**
28 Bytes.

9. **What happens to an ARP request packet when it is received by a host that does not match the target IP address of the request?**
It drops the packet.

10. **What is the value of the 'operation' field in an ARP reply packet?**
2
OPCODE: 0X0002

11. **What flags are used during a TCP connection establishment and TCP connection termination process?**
SYN
ACK
FIN

12. **A web server sends a TCP packet to a client with sequence number=0 and acknowledgement number =1. Which stage of the 3-way handshake is this and what does the sequence and acknowledgement number mean?**
The second step of the 3-way handshaking.
As part of the very first HTTP request, the client sends a TCP request with the sequence number 0. When the server sends the client with an ACK and a TCP response along with the acknowledgement number 1, it means that the server is ready to establish a connection with the client.

13. **In an outbound PDU packet, what do source port: 80 and destination port: 1027 mean?**
Port 80 is used by the receiver side to send data to the client.
Port 1027 is used by the sender side to receive an acknowledgement from the receiver side.