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

   Ans: It uses stale cache. In HTTP request cache specify date using If-modified-since: <date>. This how proxy server check to see if its up to date or not.

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

3. Can you receive mail using SMTP, why or why not?
   Ans: No. SMTP used for sending an email, it is also known as push protocol. To receive email we use POP3 or IMAP

4. Briefly explain how SMTP and POP3 protocol works using a scenario.
   Ans: to push or send a email SMTP is used. It sends an email to server. To receive and download from the server we use POP3

5. Why does root DNS servers maintain a hierarchical structure rather than a centralized structure?
   Ans: it is more robust and efficient that is why it uses hierarchical structure.

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.
   Ans: without IP address it will not be able to find the website. So it is unlikely to be able attend quiz.

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 properly?
   Ans: No

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

   Ans: 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?
   Ans: It will drop the packet.

10. What is the value of the 'operation' field in an ARP reply packet?

    Ans: 2

11. What flags are used during a TCP connection establishment and TCP connection termination process.
    Ans: 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?

13. In an outbound PDU packet, what does source port: 80 and destination port: 1027 means?

    Ans: source port 80 typically used for HTTP traffic. Port 80 is default port used for HTTP requests from clients. The destination port 1027 is not related to any specific protocol or service. It is not in range of well known port number range. It might be a private port number.