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**Sec - 09**

**Write answers to the following questions.**

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**: By using the conditional GET mechanism the proxy server can check if its data is up to date with the most updated data in the origin server.**

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

Ans: **The statement is false because HTTP protocol is an application layer protocol.**

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

Ans: **SMTP stands for simple mail transfer protocol. This protocol is an email protocol which is used for sending email messages from one email account to another. This protocol only sends messages but it is not used to receive a message. That is why, we cannot receive mail using SMTP.**

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

Ans: **SMTP and POP3 are used for sending a message and receiving the message respectively. For example, when we send an email the email client makes a TCP connection to the SMTP server and sends the mail and the address across the connection. Once the connection has been made between the client and the server the client process sends the mail instantly. The SMTP client contacts the destination’s host SMTP directly and then the mail is copied to the receiver’s SMTP. Then when the receiver wants to see his/her mail then the POP3 protocol is used to retrieve the mail from the SMTP server to his/her email client. Then the user can download the message and display it. If both the sender and receiver have the same domain name then there is no need for relay and the message is send the receivers POP3 server.**

1. Why does root DNS servers maintain a hierarchical structure rather than a centralized structure?

Ans: **Root DNS servers are not centralized because then problems such as single point of failure, increased traffic volume, distant centralized database and maintenance. That is why, root DNS maintains a hierarchical structure because it solves the above problems.**

1. 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: **Yes, I can still be able to attend my quiz because if my local DNS server does not know the IP address of “bux.bracu.ac.bd” it will check with a recursive DNS server (which is provided by the ISP). Then, the recursive DNS server which has its own cache if it has the IP address it will return it or else it will ask another DNS server. If the IP is not found then we go to the Top-level DNS servers where the information of which Authoritative name servers have the IP address for “bux.bracu.ac.bd”. When the IP address is located the recursive DNS server stores it in the local DNS cache and returns the address. Then I will be able to get to “bux.bracu.ac.bd” and attend my quiz.**

1. 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, I cannot browse the internet properly because I cannot enter sites using URLs only by using the IP addresses of the sites, I can enter them. So, in order to browse the internet using URLs, a DNS needs to be configured in the device.**

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

Ans: **The size of an ARP request or reply packet is 28 bytes.**

1. 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: **The ARP request packet is discarded when it is received by a host that does not match the target IP address of the request.**

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

Ans: **The value of the ‘operation’ field in an ARP reply packet is 2.**

1. What flags are used during a TCP connection establishment and TCP connection termination process.

Ans: **For TCP connection establishment SYN flag is used for TCP connection establishment and FIN flag us used for TCP connection termination process.**

1. 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?

Ans: **Since, the sequence number is 0 and the acknowledgement number is 1 it is in 2nd phase of the 3-way handshaking process. The sequence number keeps track of how much data has been sent and the acknowledge number is to confirm whether the transmitted data was received or not.**

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

Ans: **In an outbound PDU packet, the source port:80 means the port address for the websites. That is the outgoing packet is going from web servers. And the destination port: 1027 means the port address of the User’s PC. Which is, the target web page is being sent to the User’s PC.**