CSE421: Assignment 1- Application Layer

Total points 30/30 ?

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Section 3; Fall 2025
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Name *

Shawana Maliha

Student ID *

22101117

✓ Q1. A company's employees are reporting that they can't access a website by typing its domain name, but they can access it by entering its IP address. Which networking component is most likely causing the issue?   *1/1

○ The web server is down

○ The firewall is blocking HTTP traffic

◉ The DNS server is failing to resolve domain names   ✓

○ The SMTP server is not functioning

✓ Q2. Alice sends an email to Bob at bob@company.com, but Bob doesn't *1/1
receive the email. Upon checking, Alice's mail server has been retrying for
a few days. What is the most likely reason for this?

○ The email is stuck in Bob's spam folder

◉ Bob's mail server is temporarily down or unreachable ✓

○ Alice's email application has a bug

○ SMTP doesn't support email retry mechanisms

✓ Q3. Which of the following is an advantage of using IMAP over POP3? * 1/1

○ Emails are stored locally and deleted from the server

◉ Emails can be accessed from multiple devices without downloading them ✓

○ IMAP does not require authentication

○ IMAP does not support folder synchronization

✓ Q4. Which protocol is used for retrieving emails from a mail server while *1/1
keeping messages stored on the server?

○ POP3

◉ IMAP ✓

○ SMTP

○ HTTP

✓ Q5. What is the primary function of the Domain Name System (DNS)?   1/1

○ To send emails between mail servers

◉ To translate domain names into IP addresses   ✓

○ To encrypt internet communications

○ To establish a secure connection between two hosts

✓ Q6. What type of DNS record is used to map a hostname to an IP address? 1/1

○ MX

○ CNAME

◉ A   ✓

○ NS

✓ Q7. Which of the following statements about SMTP is correct?   1/1

○ SMTP is used for retrieving emails from a server

○ SMTP only works with IMAP, not POP3

◉ SMTP is a push protocol that sends email from a client to a mail server   ✓

○ SMTP is responsible for name-to-IP translation

✓   Q8. A network administrator notices that users are experiencing delays   *1/1
    when trying to access websites, even though the internet connection is
    stable. Upon investigation, they find that DNS queries are taking longer
    than usual. Which of the following is the most likely cause?

◉ The DNS cache on local name servers has expired, causing repeated lookups   ✓

○ The web server is experiencing high traffic

○ The firewall is blocking HTTP requests

○ The SMTP server is overloaded

✓   Q9. A multinational company hosts its website on multiple servers   *1/1
    worldwide, ensuring faster access for users from different locations. The
    company uses DNS to distribute user requests among these servers.
    What DNS feature enables this distribution?

○ DNS recursion

◉ Round-robin load balancing   ✓

○ DNS caching

○ MX records

✓   Q10. Name the HTTP request method that allows Proxy servers to   *1/1
    request the same object, which the Proxy server already has a copy in its
    cache.

○ POST

○ PUT

◉ Conditional GET   ✓

○ DELETE

✓ Q11. You are working on a web application and notice that users are   *1/1
   submitting sensitive data (e.g., passwords, credit card details) over the
   network. The data is being transmitted using HTTP, which is not secure.
   You decide to upgrade the website to HTTPS to ensure the security of
   user data.

   What is the primary advantage of using HTTPS over HTTP?

   ● HTTPS encrypts the data being transmitted, preventing it from being   ✓
     intercepted by attackers.

   ○ HTTPS improves website loading speed by reducing latency.

   ○ HTTPS allows for faster DNS resolution than HTTP.

   ○ HTTPS makes the website accessible only to certain users.

✓ Q12. You are working with an API that uses HTTP methods. You want to   *1/1
   update an existing resource on the server, such as modifying a user's
   profile information.

   Which HTTP method should you use for this operation?

   ○ GET

   ○ POST

   ● PUT   ✓

   ○ DELETE

✓ Q13. You are setting up an HTTP server to handle a high volume of traffic. *1/1
The server supports both persistent and non-persistent HTTP
connections. The server is configured to handle multiple requests over a
single connection in order to reduce connection overhead.

Which HTTP header will the server include in the response to indicate
that the connection will be kept open for further requests?

○ Connection: close

⦿ Connection: keep-alive   ✓

○ Content-Length: 0

○ Cache-Control: no-cache

✓ Q14. A user enters a URL http://google.com/secret_page into their *1/1
browser, but the server responds with an HTTP 404 status code,
indicating that the page was not found. The user is able to access other
pages on the website without issue.

What is the most likely cause of this response?

○ The server is redirecting the user to a different page.

○ The user has entered an incorrect URL, but the server is still attempting to serve it.

⦿ The requested page has been deleted or moved, and no redirect is configured.   ✓

○ The server is down and is unable to process any requests.

✓ Q15. A user is trying to send an email, but their email client is   *1/1
   continuously failing to connect to the outgoing mail server. The system
   administrator checks and finds that outgoing connections on port 25 are
   blocked. Which protocol is being affected?

○ IMAP

◉ SMTP   ✓

○ POP3

○ DNS

✓ Q16. You are setting up a proxy server for a company to improve network   *2/2
   performance. The proxy server is configured to cache frequently
   requested web pages. As a result, when users request the same
   resources, they are served from the cache rather than being fetched from
   the origin server.

   What is the primary benefit of using a proxy server with caching in this
   scenario?

☐ It reduces the need for DNS resolution.

☐ It increases the security of the network by filtering malicious content.

☑ It reduces bandwidth consumption.   ✓

☐ It ensures that all user data is encrypted before transmission.

☑ It speeds up access to frequently requested resources.   ✓

✓ Q17. Suppose the client-to-server HTTP GET message is the following: *1/1

GET drive/schedule/index1.htm HTTP/1.1
Host: bracu.ac.bd
Accept: text/plain, text/html, image/png, image/gif, audio/basic,
audio/mp4, video/wmv, video/mp4,
Accept-Language: en-us, en-gb;q=0.2, en;q=0.3, fr, fr-ch, zh
If-Modified-Since: Wed, 13 Nov 2024 12:11:00 -0800
User Agent: Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/535.19
(KHTML, like Gecko) Chrome/18.0.1025.162 Safari/535.19

What is the name of the file that is being retrieved in this GET message?

○ drive/schedule/index1.htm

◉ index1.htm   ✓

○ bracu.ac.bd/drive/schedule/index1.htm

○ index1.txt

✓ Q18. HTTP is stateless, meaning: *   1/1

◉ Every HTTP request the server receives is independent   ✓

○ All user requests are being tracked

○ Receiver must retain session state from previous requests.

○ Requests are sent using cookies

Q19. Neel has requested a webpage using a non-persistent HTTP connection. The webpage has 12 objects, excluding the base HTML file, and each object is 2 MB. It takes 15 ms to send a TCP request from her device to the server and come back. Also, the HTTP request and response for each object is 30 ms. The server has a speed of 500 Mbps.

✓   (a) Calculate the total RTT required in ms for all objects (in ms). *   4/4

585   ✓

✓   (b) Calculate the total file transmission time in ms for all webpage   *4/4
    objects (in ms).

416   ✓

Feedback

*(13*16)/500 =0.416sec=416ms*

✓   (c) Calculate the webpage loading time (in ms). *   3/3

1001   ✓

Upload your calculations of Q19 in pdf/jpg format: *

🖼 IMG_8012 - SHA...

⬆ Add file

Google Forms