
Assignment 1: Computer Networks

Weightage : 5 Marks

Submission Date : 17/8/25 (5:00pm)

Late Submission Date : 19/8/25 (5:00pm) will cost 2 marks

Submission Link :https://forms.gle/K7jbxiJutKm3FW8Q7

Q1. (3 Marks)

Describe the following terms related to Eletronic mail applications.

(i) Eletronics mail architecture.

(ii) Mail Transfer Phases,

(iii) Message access agent,

(iv) Multipurpose Internet mail extension

Q2. (3 Marks)

Assume there is a server with the domain name www.kiit.ac.in.

Write the HTTP request that needs to retrieve the document **/usr/users/doc**. The client accepts MIME version 1, GIF or JPEG images.

Q3. (3 Marks)

A client's browser sends an HTTP request to a website. The website responds with a handshake and sets up a TCP connection. The connection setup takes 8.4 mili seconds(ms), including the RTT. The browser then sends the request for the website's index file. The index file references 22(twenty two) additional images, which are to be requested/downloaded by the client's browser.

Assuming all other conditions are equal, how much longer would non-persistence HTTP take than persistence HTTP.

Q4 (1 Marks)

What is the main difference between a Fully Qualified Domain Name (FQDN) and a Partially Qualified Domain Name (PQDN)? CNAME record are used for which purpose.

Q5(2 Marks)

Calculate the total time required to transfer a 1.5MB file based on following information.
The bandwidth is 10Mbps, but after we finish sending each data packet we must wait one RTT before sending the next.
Assuming a RTT of 80 ms, a packet size of 1 KB data, and an initial 2×RTT of "handshaking" before data is sent.

Q6 (2 Marks)

Assume that you have made a request for a web page through your web browser to a web server. Initially the browser cache is empty. Further, the browser is configured to send HTTP requests in non-persistent mode. The web page contains text and five very small images. The minimum number of TCP connections required to display the web page completely in your browser is _____.

Q7. (2 Marks)

Consider 2 computers x and y connected by a single line of bandwidth 512 mbps. Let propagation speed be $2x10^9$ meter per second. The the packet length be 1 kb. Calculate the distance between x and y if propagation delay is same as transmission delay.

Q8. (10 Marks)

A) A user is suppose to access a Web page. The IP address for the associated URL is not known to the local host, so a DNS lookup is carried out to obtain the IP address. Suppose, n DNS servers are visited before your host receives the IP address from DNS; the successive visits incur an RTT of RTT1, . . ., RTTn. Further suppose that the Web page associated with the link contains exactly one object, consisting of a small amount of HTML text. Let RTT0 denote the RTT between the local host and the server containing the object. Calculate the time elapses from when the client clicks on the link until the client receives the object?

B) Explain Email protocols in detail (SMTP,MIME and POP3).

Q9. (1 Marks)

What would be the type of resource record (RR) that contains the canonical name of the host?

Q10. (1 Marks)

In a client-server architecture, why is it necessary to keep the server always on where as the client can be on or off from time to time.

Q11. Write a short note on (3 Marks)

(a) Circuit-switching vs packet switching.

(b) Multiplexing vs de-multiplexing.