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Assignment – 1

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Semester: 4th   **Date of Performance:** 06/03/2022
Subject Name: Computer Network   **Subject Code:** 20CSP-256

1. Aim/Overview of the practical:

If someone wants to open a Facebook page, how OSI model will work using its different layers?

Theories:

Now that your browser knows the IP address of the server, it needs to find a way to pass this request all the way to the server.

There's a lot of stuff that needs to be managed for smooth communication between browser and server.

There's something called an OSI (Open System Interconnection) model that standardizes communication between different computing machines.

It describes the flow of information from one computer to another. It defines seven layers, and the interplay of these layers magically brings, for example, Facebook.com from the server to your machine. At both ends (client and server), these layers are followed, but there is a difference in the flow of which layer kicks in first. When your browser sends the request, communication starts at the application layer and goes down to the physical layer—whereas in the server, while receiving the request, it would start at the physical layer, going up.

Application layer: consists of protocols that directly interact with the end user. A protocol defines how different applications across machines communicate with each other. If you are requesting a web page, HTTP (Hyper Text Transfer Protocol) will handle it, and if you are sending an email, SMTP (Simple Mail Transfer Protocol) will handle it. So in the case of Facebook[dot]com, your browser generates a HTTP request. Don't confuse the browser as part of the application layer. The role of application layers comes in when your browser creates a HTTP request. This HTTP request is part of the application layer.

Presentation layer: Depending on your request (image, video, text, GIF, etc.), this layer converts and presents the data in readable format. In the case of Facebook[dot]com, when your machine received it, the presentation layer would kick in to render it as a HTML page.

Session layer: responsible for establishing, maintaining, and terminating the session between devices. For example, when you are doing video chat, the time you enter into the chat to the time you leave it is one complete session, given there were no interruptions during that interval. However, in the case of Facebook[dot]com, HTTP uses lower layer protocol, instead of session layer protocols.

Transport layer: takes care of the reliability, safety and security of the path taken between the request and response. Here, the transportation, delivery and assembling of data takes place. When you are requesting Facebook[dot]com, essentially, you are not sending any data, but the role of this layer is more evident when you receive the data. The data your machine receives comes divided into packets with a sequence number assigned to each packet, called data payloads. This layer makes sure that you have received all packets and reassembles them in order.

Network layer: This organizes and routes the data. It also decides which transfer protocols to use. So, in the case of Facebook[dot]com, the best path to route the data between your machine and web server is determined by the IP (Internet Protocol).

Data link layer: In this layer, data is broken down into pieces. So when the server sends Facebook[dot]com, it doesn't send the entire page all at once; rather, the data link layer segments it, encapsulates it and transmits it as packets (data payloads) through the physical layer. It is not necessary that the packets be delivered directly to your machine. It may travel from network to network, passing through many machines before reaching you. So in this case, IP addresses with all of these hops are translated to hardware addresses, at the data link layer.

 Physical layer: The physical layer deals with the actual connectivity between your machine and the server. The hardware and signalling and encoding mechanisms required to form the actual connection are defined at this layer, and the data received from the server is in the form of raw bits.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.			
2.			
3.			