**NGUGI FELISTER NJERI SCT 212-0720/2022 Bsc.CT 2.1**

**ASSIGNMENT 1 BIT 2204 NETWORK SYSTEMS ADMINISTRATION**

***In 300 words write a write-up on the difference between the 7-layer OSI reference model and the TCP/IP model***

The Open Systems Interconnection (OSI) reference model and the Transmission control protocol/internet protocol (TCP/IP) model are two different conceptual frameworks used to understand and standardize networking protocols and communication processes. They both provide a way to conceptualize how data is transmitted over a network, but they have some differences in terms of the number of layers and the specific protocols associated with each layer.

First, the number of Layers. The OSI model consists of seven distinct layers, which are, from the bottom up: Physical, Data Link, Network, Transport, Session, Presentation, and Application whereas the TCP/IP model is often simplified into four layers. These layers, from the bottom up, are: Network Interface, Internet, Transport, and Application. The biggest difference between the two models is that the OSI model segments multiple functions that the TCP/IP model groups into single layers. This is true of both the application and network access layers of the TCP/IP model, which contain multiple layers outlined within the OSI model. it can make it more difficult to troubleshoot issues or enhance performance when you are using the TCP/IP model. With the OSI model, for example, you can focus specifically on the application layer, presentation layer, or session layer to figure out why data is not coming out the way you expect. With the TCP/IP model, on the other hand, the functions of these three layers are all combined in the application layer.

We also consider the Specific Protocols. The OSI model is a theoretical framework and does not prescribe specific protocols for each layer. Instead, it provides a conceptual structure that different networking protocols can fit into. Some of the common protocols associated with the OSI model include Ethernet (Data Link), IP (Network), TCP and UDP (Transport), and HTTP (Application). The TCP/IP Model is more closely associated with the actual protocols that were developed for the early Internet. Some common protocols mapped to the TCP/IP model include Ethernet (Network Interface), IP (Internet), TCP and UDP (Transport), and HTTP, FTP, and SMTP (Application).

OSI model, the transport layer, is only connection-oriented, whereas the TCP/IP model is both connection-oriented and connectionless. TCP is a connection-oriented protocol on the OSI model that provides a highly reliable, ordered, and error-checked data transfer mechanism. The data is divided into segments, and these segments are sent sequentially. The receiver acknowledges the receipt of each segment and requests retransmission if any are lost or corrupted. This process ensures the complete and error-free delivery of data. In the TCP/IP model, the transport layer is more versatile and can support both connection-oriented and connectionless communication. the TCP/IP transport layer also includes the User Datagram Protocol (UDP), which is connectionless. In UDP, there is no establishment of a connection before data transmission. Data is sent as individual datagrams, without guarantees of order or reliability. It's a "best-effort" protocol, making it suitable for applications where speed and lower overhead are more critical than guaranteed delivery.

In summary, while both the OSI and TCP/IP models provide a framework for understanding network communication, the TCP/IP model is more widely recognized and directly applicable to the protocols used on the internet. The OSI model, while informative, is not as commonly used in practice and has not had the same real-world impact on networking and communications.