Solutions to Week 8 Data Communication 1

Question 1

Explain in a few sentences, what are the functions of the **Network (or Internet) Layer and the Data Link Layer** of the TCP/IP model.

Question 2

What is the purpose of Address Resolution Protocol (ARP)? What does an ARP request/response packet contain? How does it work in different cases given below:

1. **CASE-1:** The sender is a host and wants to send a packet to another host on the same network.
2. **CASE-2:** The sender is a host and wants to send a packet to another host on another network.
3. **CASE-3:** the sender is a router and received a datagram destined for a host on another network.
4. **CASE-4:** The sender is a router that has received a datagram destined for a host in the same network.
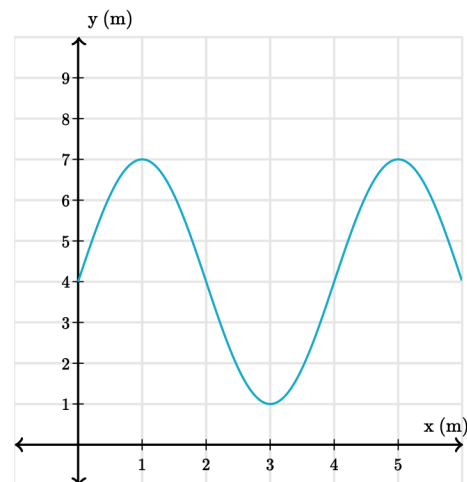
Question 3

What is the Internet Control Message Protocol (ICMP)? What is ICMP used for?

Question 4

A transverse wave on a string travels at 20m/s. A graph of the height of the wave along the x-direction at a certain moment is shown below.

What is the frequency of the wave along the string?

Question 5

What are the differences between a MAC address and an IP address?

Explain the use of MAC address and IP address.

Question 6

What are TCP/IP Encapsulation and Decapsulation?

Explain in a few sentences, how data is encapsulated at different layers.