**IT210 - Computer Network**

**Assignment 1**

Q 1. Define the three types of data flow. *(1 mark)*

Ans:

* + In **simplex mode**, the communication is unidirectional, as on a one-way street. Only one of the two devices on a link can transmit; the other can only receive.
  + In **half-duplex** mode, each station can both transmit and receive, but not at the same time. When one device is sending, the other can only receive, and vice versa. The half-duplex mode is like a one-lane road with traffic allowed in both directions.
  + In **full-duplex** mode (also called **duplex**), both stations can transmit and receive simultaneously. The full-duplex mode is like a two-way street with traffic flowing in both directions at the same time.

Q 2. What are the two principles of Protocol Layering? *(1 mark)*

Ans:

* + The first principle dictates that if we want bidirectional communication, we need to make each layer so that it is able to perform two opposite tasks, one in each direction.
  + The second principle that we need to follow in protocol layering is that the two objects under each layer at both sites should be identical.

Q 3. A sine wave is offset 1/4 cycle with respect to time 0. What is its phase in degrees and radians? *(1 mark)*

Ans:

* + 1/4 x 360 = 90ْ = 90 x 2Pi/360 = 1.57 rad

Q 4. List three properties for Infrared waves. *(1 mark)*

Ans:

* + Waves with frequencies from 300 GHz to 400 THz
  + They are used for short-range communication
  + They cannot penetrate walls