CS 372 Introduction to Computer Networks
Self-Check Exercises: Lecture 3a **Solutions**

1) A **circuit**-switched network has a **dedicated** circuit through which information is sent, whereas a **packet**-switched network sends information in "chunks" through a network on **shared** media

2) What units are we using for network bandwidth? bps

3) What units are used for transmission rate? bps

4) What is done with network resources in a circuit switched network to allow multiple users to utilize the network?
The network resource is divided into chunks

5) What is the difference between TDM and FDM
TDM divides the available bandwidth into discrete blocks of time, during which only one of the users is permitted to transmit. FDM divides the available into bands of frequency (like radio stations), in which only one user is permitted to transmit.

6) How long does it take to send a 13 KiB file from Host A to Host B over a circuit-switched network, assuming
Total link transmission rate = 500Mbps
The network is FDM, with 250 permitted users, each with an equal bandwidth share
A link connection setup requires 100ms.
File size (L) = 13KiB = 13 * 1024 Bytes = 13 * 1024 * 8 bits = 106,496 bits
One link's transmission rate (R) = 500Mbps / 250 users = 2Mbps = 2,000,000 bps
Time to transmit file = L/R = 106496 bits / 2,000,000 bps = 0.053248 s = 53.25 ms
Total sending time = setup time + transfer time = 100ms + 53.25ms = **153.25ms**

7) What are three important functions of a packet-switched network
Packet Construction, Transmission, and Interpretation