Institute of Information Technology
Jahangirnagar University, Savar, Dhaka
2nd Year 2nd Semester B.Sc. (Hons.) Final Assignment

Course Code: IT-2205 Course Title: Data Communications

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1. Ten sources, six with a bit rate of 200 kbps and four with a bit rate of 400 kbps are to be combined using multilevel TDM with no synchronizing bits. Answer the following questions about the final stage of the multiplexing: 4
   a. What is the size of a frame in bits?
   b. What is the frame rate?
   c. What is the duration of a frame?
   d. What is the data rate?

2. Five equal-size datagrams belonging to the same message leave for the destination one after another. However, they travel through different paths as shown in the following table: 4

Datagram	*Path Length*	*Visited Switches*
1	3200Km	1,3,5
2	11,700 Km	1,2,5
3	12,200 Km	1,2,3,5
4	10,200 Km	1,4,5
5	10,700 Km	1,4,3,5

   We assume that the delay for each switch (including waiting and processing) is 3, 10, 20, 7, and 20 ms respectively. Assuming that the propagation speed is 2×10^8 m, find the order the datagrams arrive at the destination and the delay for each. Ignore any other delays in transmission.

3. What is the required bandwidth for the following cases if we need to send 6kbps? Let d=1. 2
   a. ASK
   b. QPSK