

International Islamic University Chittagong

Department of Computer Science and Engineering

Final Examination, Autumn-2018

Course Code: CSE 3601

Course Title: Data Communication

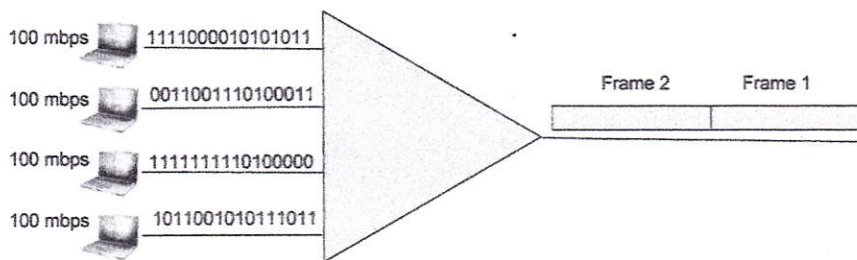
Total Marks: 50

Time: 2 hours 30 minutes

Answer any **Two** from part-A and any **Three** from part-B from following questions.

Part-A

1. (a) Define data rate and signal rate. 2
(b) Describe QAM with appropriate diagram. 4
(c) Write the constellation diagram of ASK, BPSK, QPSK and 4-QAM. 4
2. (a) Why do we use carrier signal in analog transmission? 2
(b) Find the bandwidth for a signal transmitting at 12 Mbps for QPSK. The value of $d=0$. 3
(c) Write down the difference between ASK and PSK with an example. 3
(d) Distinguish between synchronous and statistical TDM. 2
3. (a) Four computers are being multiplexed using synchronous TDM having byte interleave according to the following figure. Show output bit stream and find output bit rate, frame rate, output bit duration, frame duration. 5



- (b) What is spreading? Describe different types of spreading techniques with appropriate examples. 5

Part-B

4. (a) What is a switched network? Compare and contrast a circuit-switched network and a packet-switched network. 5
(b) What is virtual-circuit network? Describe its data transfer phase, setup phase and tear down phase with necessary diagram. 5
5. (a) Explain the reason for moving from the Go-Back-N ARQ protocol to the Selective Repeat ARQ protocol. 3
(b) Define framing and the reason for its need. 3
(c) What is Internet checksum? Suppose a packet has payload "101011011111011100101001". If 8 bits chunks are taken for the checksum then find the codeword. 4
6. (a) We need a dataword of at least 11 bits. Find the values of k and n in the Hamming code $C(n, k)$ with $d_{min}=3$. 5
(b) Given the dataword 1010011110 and the divisor 10111, Show the generation of the codeword at the sender site (using CRC code). Show the checking of the codeword at the receiver site (assume no error). 5
7. Write short notes on the following topics:
 - (a) Wired LAN 2.5
 - (b) Wireless LAN 2.5
 - (c) Virtual LAN 2.5
 - (d) Optical Network 2.5