International Islamic University Chittagong

Department of Computer Science & Engineering

B. Sc. in CSE Semester Final Examination, Spring 2018

Course Code: CSE 3601 Course Title: Data Communication

Total marks: ***50*** Time: ***2 hours 30*** minutes

[Answer any ***two*** questions from **Group-A** and any ***three*** questions from **Group-B;**
Separate answer script must be used for Group-A and Group-B;

Group-A

1. a)	What do you mean by digital to analog conversion?	2
b)	Define bit rate and baud rate. An analog signal carries 4 bit in each signal unit. If 1000 signal units are sent per second, find the baud rate and the bit rate.	3
c)	Why is frequency modulation superior to amplitude modulation? You have an available bandwidth of 100 kHz which spans from 200 to 300 kHz. What should be the carrier frequency and the bit rate if we modulated our data by using FSK with d=1?	3
d)	Write down the advantage of QAM over ASK or PSK.	2
2. a)	What is multiplexing? Write down the purpose of multiplexing.	2
b)	How does FDM combine multiple signals into one? Assume that a voice channel occupies a bandwidth of 4 kHz. You need to combine three voice channels into a link with a bandwidth of 12 kHz, from 20 to 32 kHz. Show the configuration, using the frequency domain. Assume there are no guard bands.	4
c)	Describe QAM with appropriate example and diagram.	4
3. a)	Write the steps in PCM and explain its operations.	4
b)	Suppose that we want to digitize the human voice. What is the bit rate, assuming 8 bits per sample?	3
c)	Write down the comparison between PCM and DM.	3

Group-B

4. a)	Discuss the concept of redundancy in error detection. What are three types of redundancy checks?	3
b)	Discuss the two dimensional parity check and the types of errors it can and cannot detect.	2
c)	How does the CRC checker know that the receiver data unit is undamaged?	2
d)	Draw the sender's and receiver's windows for a system using Go-Back-N ARQ, given the following (i) Frame 0 is sent; frame 0 is acknowledged. (ii) Frames 1 and 2 are sent; frames 1 and 2 are acknowledged. (iii) Frames 3, 4, and 5 are sent; frame 4 is acknowledged; timer for frame 5 expires. (iv) Frames 5, 6, and 7 are sent; frames 4 through 7 are acknowledged	3
5. a)	Define Ethernet. Summarize the goals of Gigabit Ethernet design.	3
b)	What is the difference between a unicast, multicast, and broadcast address?	3
c)	Write the difference between a basic service set (BSS) and an extended service set (ESS) of IEEE 802.11?	2
d)	Discuss the hidden station problem. How do you solve it?	2
6.a)	Discuss why data link layer is divided into two sub layers. List the media access control protocols.	4
b)	If an Ethernet destination address is 07:01:02:03:04:05, what is the type of the address?	2
c)	Briefly discuss about soft handoff, Hard handoff and Roaming.	4
7.a)	What are the different types of error in data communication? Briefly discuss i) Error detection versus error correction ii) Forward error correction and retransmission	4
b)	What is reuse factor? Describe with example.	3
c)	Define framing and the reason for its need.	3