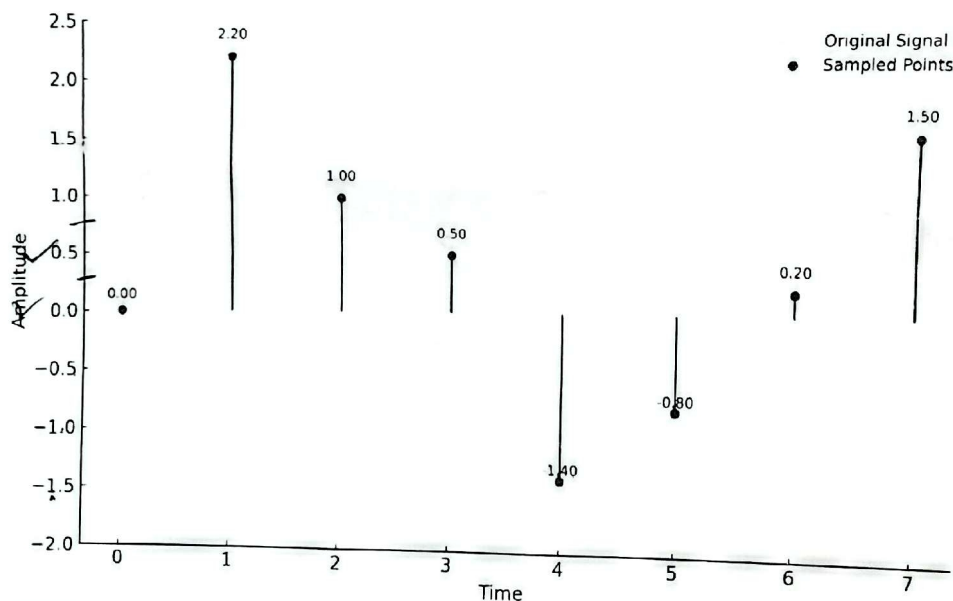




University of Barishal
Department of Computer Science & Engineering
B.Sc. 2nd Year 2nd Semester Final Examination-2024
Course Code: CSE-2205, Course Title: Data Communication
Admission Session: 2022-23
Time: 03 hour
Full Marks: 60

There are eight questions. Answer five of the questions. Figures in the right-hand margin indicate full marks.

1. (a) What is protocol layering? Describe all the layers in the TCP/IP protocol suite. Mention a main difference between OSI and TCP/IP model. [07]
(b) What is VCI in virtual circuit network? Briefly describe the three phases of a virtual circuit network with an example. [05]
2. (a) What is a composite signal? How can we decompose it into its components? Explain it briefly. [03]
(b) Briefly describe the time domain and frequency domain representation of a signal. [03]
(c) What are the transmission impairments? Write their differences. [03]
(d) The loss in a cable is usually defined in decibels per kilometer (dB/km). If the signal at the beginning of a cable with -0.2 dB/km has a power of 6 mW, what is the power of the signal at 20 km? [03]
3. (a) How can we measure the performance of a network? Briefly describe the following terms: Bandwidth, Latency, Throughput, Bandwidth-delay product and Jitter. [05]
(b) Please do the analog to digital (ADC) conversion process of the following sampled signal using pulse code modulation (PCM) method and find out the digital data of each sample in 3 bit. [05]



- (c) What is QAM? Draw an 8-QAM signal of the following bit stream- 010 011 111 110 101 000 001 [02]
4. (a) What will be the problem if we don't follow the Nyquist theorem during sampling an analog signal. Explain with a proper illustration. [04]
(b) Which digital to analog conversion technique is the most susceptible to noise and why? ASK [04]
(c) Explain the differences among different analog to analog conversion processes. [04]
5. (a) Explain IP spoofing and packet sniffing? [04]
(b) In a noisy channel, Selective Repeat ARQ protocol can solve the problems what other ARQ protocols (stop and Wait ARQ, Go-back-N ARQ) may face. What is that problem and how it can solve this? and explain this selective repeat ARQ protocol with a proper diagram and examples. [04] [08]

- 6/ (a) Explain briefly two-dimensional parity-check code. How many bits can be checked if there has been any error occurred or not? Can we do error correction using this technique? [05]
- (b) Assume, A sender sends the data 111001011. Now, using C (13,9) and the divisor 11101, Show how the codeword is generated by CRC method. If the receiver receives the codeword 111001101, how to decide whether an error has occurred or not. Show the process in detail. [07]
7. (a) What is Media Access Control (MAC)? How many protocols are there? Name all of them. [03]
- (b) Compare and contrast HDLC with PPP. [04]
- (c) Write the differences among random-access protocols, controlled-access protocols and channelization protocols of MAC [05]
8. Write short notes on the following topics: [3*4 = 12]
- a) Piggybacking
 - b) Satellite communication and Categories of Satellite
 - c) WiMAX vs Wi-Fi
 - d) Cellular telephony