Daffodil International University

Faculty of Business and Entrepreneurship

Department of Business Administration

Semester: Spring-2026 Examination: Mid-term

Time: 1.5 Hours Full Marks: 25

Course Code: MIS-612-325

Course Title: Data Communication and Networking for Business

(Answer the all questions)

1. a) Define data communication. Explain how accuracy, timeliness, and security affect business communication efficiency. [CLO-1, L1–L3] – 2 Marks

b) Illustrate and explain the five components of a data communication system with a neat labeled diagram. Then explain how failure of any one component affects the entire system. [CLO-2, L2–L3] – 3 Marks

2. a) Compare analog and digital signals in terms of:
   - Waveform
   - Noise immunity
   - Bandwidth requirement
   - Business application

Present your answer in tabular form. [CLO-1, L2–L4] – 2 Marks

b) A company needs to transmit high-speed financial transaction data securely.
   i. Recommend a suitable line coding or digital modulation technique.
   ii. Justify your choice in terms of bandwidth efficiency and error performance.
   iii. Mention one limitation of the technique. [CLO-3, L3–L4] – 2 Marks

c) Explain the OSI model layer-by-layer. Then analyze why businesses mostly use the TCP/IP model instead of the OSI model in real-world networking. [CLO-3, L2–L4] – 2 Marks

3. a) Define multiplexing. Compare FDM, TDM, and WDM with respect to:
   - Medium used
   - Bandwidth usage
   - Real-life business application [CLO-2, L2–L4] – 3 Marks

b) Evaluate the following transmission media for a growing e-commerce company:
   - Twisted Pair
   - Coaxial Cable
   - Fiber Optic
   - Wireless (Microwave/Radio)

Which one is most suitable for long-term scalability? Justify your answer technically and economically. [CLO-5, L4–L5] – 3 Marks

4. A growing online service company in a semi-urban area of Bangladesh initially used a dial-up modem connection through the traditional telephone network. At the early stage, the slow connection was sufficient because the company handled limited online activities such as email communication and basic website updates. However, over the past few years, the company has expanded significantly and now provides online customer support, digital payment processing, cloud data storage, and multimedia uploads. Due to this growth, the dial-up connection has become inadequate, causing low bandwidth, high latency, frequent disconnections, and security vulnerabilities.

The management expects a 300% increase in online transactions within the next five years and plans to expand nationwide. To ensure reliable, secure, and high-speed connectivity, the company is considering upgrading to DSL, Fiber Optic Broadband, or Satellite Internet. Since each option differs in speed, reliability, cost, and scalability, the company must carefully evaluate and select the most suitable technology to support long-term business growth and customer satisfaction.

Based on the given case study, answer the following questions:

a) Identify and explain how the technical limitations of dial-up Internet (bandwidth, latency, disconnection, and security issues) directly affect the following business operations:

- Online payment processing
- Cloud data storage
- Customer support services

Explain the impact logically using networking concepts. [CLO-4, L3] – 2 Marks

b) Compare DSL, Fiber Optic, and Satellite Internet in terms of:

- Bandwidth capacity
- Reliability and stability
- Installation and maintenance cost
- Scalability for future expansion

Present your comparison in structured tabular form and analyze which two technologies are technically superior for long-term business growth. [CLO-4, L4] – 3 Marks

c) Assume the company plans to expand nationally within five years and expects a 300% increase in online transactions.

As a network consultant:

i. Select the most appropriate Internet technology.
ii. Justify your choice using technical, economic, and strategic reasoning.
iii. Recommend additional network improvements (e.g., topology, redundancy, basic security measures).

Your answer must demonstrate integrated business-technical evaluation. [CLO-5, L5] – 3 Marks