ICE-3261
Communication Engineering

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Course Outline

Topics included:

Communication engineering fundamentals, analog communication, digital communication, various modulation-demodulation techniques, error control, block control, propagation techniques, satellite communication, Fiber optic communication

Course materials:

1. **Text books**:
   i) Data Communication and Networking, **5th Edition**, Behrouz A. Forouzan
   ii) Data and Computer Communications, William Stallings, **8th Edition**
2. **Reference books**:
   i) Data Communication, Computer Network and Open Systems, F. Halsall
   ii) Computer Networks, Andrew S. Tanenbaum
   iii) Optical Fiber Communications, John M. Senior

Tentative Class Schedules

1st week:	Fundamentals of communication engineering, Data and Signals – fundamental concepts
2nd week:	Digital communication fundamentals – transmission modes, impairments
3rd week:	Digital transmission: digital to digital conversions – Line coding scheme
4th week:	Digital transmission: digital to digital conversions – Block coding schemes
5th week:	Digital transmission: analog to digital conversions – PCM, DM, Transmission modes
6th week:	Analog transmission: Digital to analog conversions
7th week:	Analog transmission: Analog to analog conversions – AM, FM, PM
8th week:	Error detection and correction
9th week:	Multiplexing
10th week:	Transmission Media: Guided media, fiber optic communication, Unguided media, Propagation
11th week:	Satellite Communication

Evaluation

-Marks-75

(70% Exam, 20% Quizzes/Class Test, 10% Attendance)

-Credit-3 (Examination 3 Hours)

-Strategies:

Class Test – I	**–**	**4%**
Class Test – II	**–**	**4%**
Class Test – II	**–**	**4%**
Surprise Test	**–**	**4%**
Assignments	**–**	**4%**
Attendance	**–**	**10%**
Final exam	**–**	**70%**

Chapter 1

Introduction

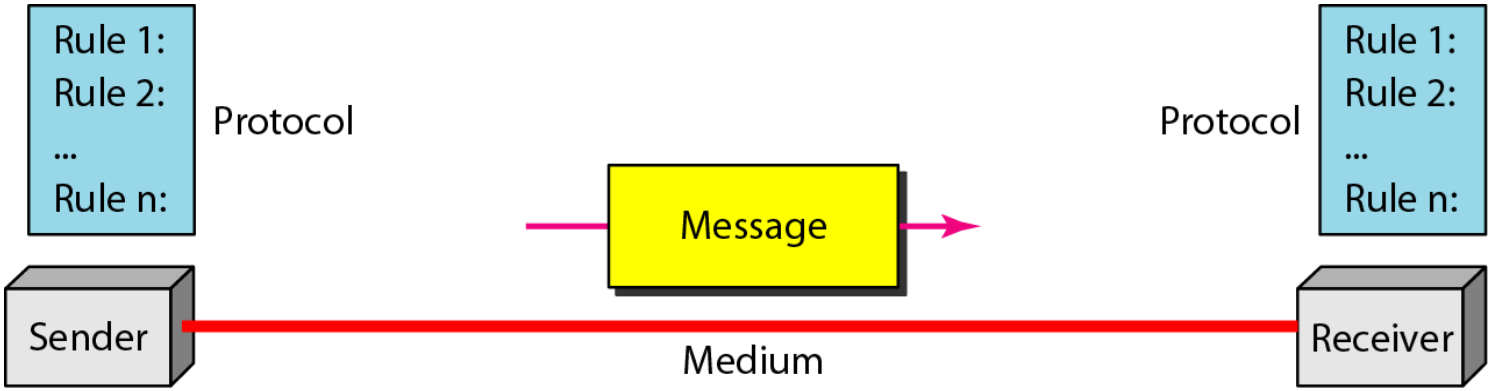
1-1 DATA COMMUNICATIONS

The term telecommunication means communication at a distance. The word data refers to information presented in whatever form is agreed upon by the parties creating and using the data. Data communications are the exchange of data between two devices via some form of transmission medium such as a wire cable.

Topics discussed in this section:

- **Components of a data communications system**
- **Effectiveness**
- **Data Flow**

Figure 1.1 *Components of a data communication system*



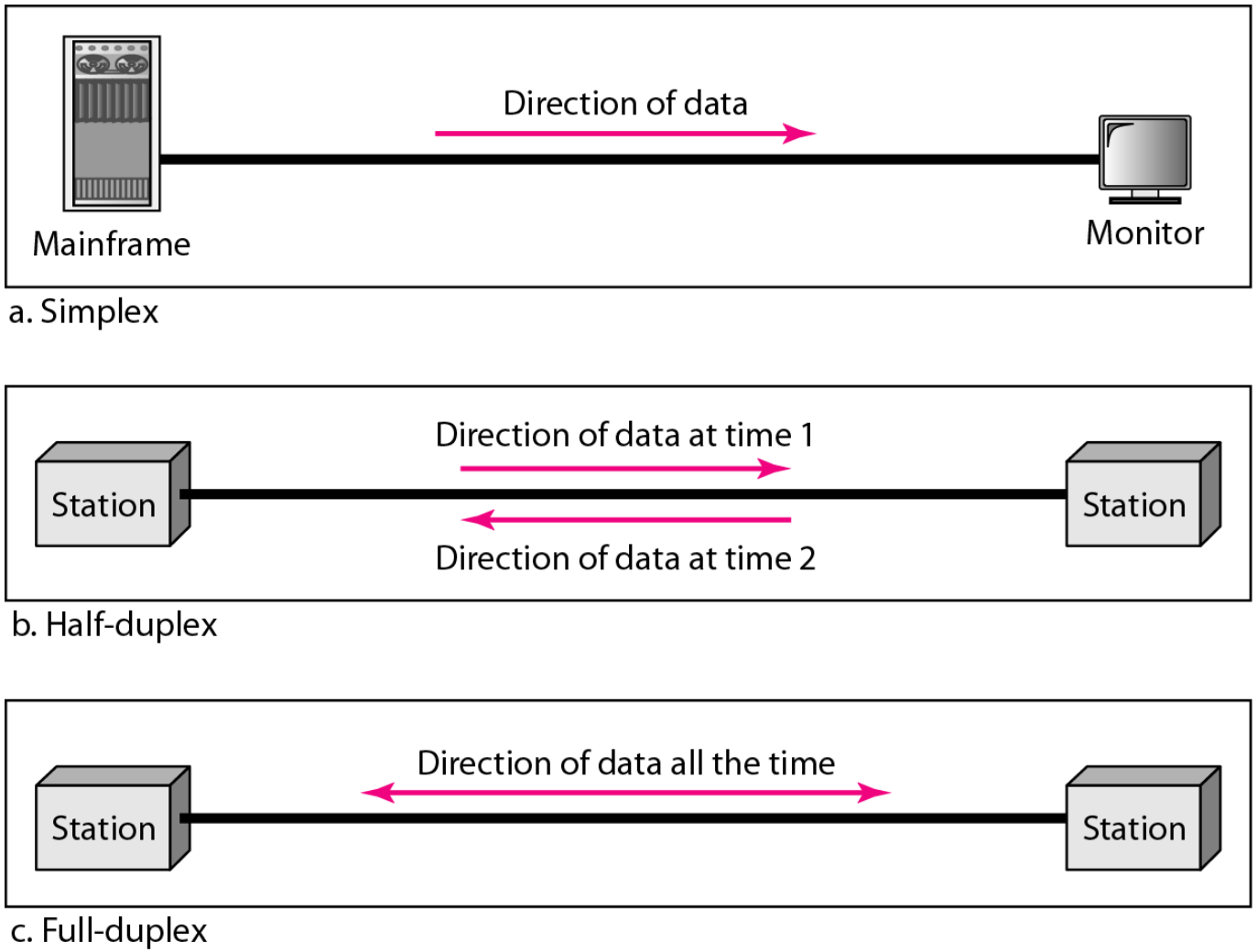
Effectiveness

- ***Delivery – Correct destination***
- ***Accuracy – Unaltered***
- ***Timeliness – Timely***
- ***Jitter – Uneven delay***

Data Representation

- Text – Code, Unicode (32 bit), ASCII (127 Char)
- Numbers – binary conversion
- Images – RGB, YCM (CMYK)
- Audio
- Video

Figure 1.2 *Data flow (simplex, half-duplex, and full-duplex)*



1-4 PROTOCOLS

A protocol is synonymous with rule. It consists of a set of rules that govern data communications. It determines what is communicated, how it is communicated and when it is communicated. The key elements of a protocol are syntax, semantics and timing

Topics discussed in this section:

- **Syntax**
- **Semantics**
- **Timing**

Elements of a Protocol

- **Syntax**
  - **Structure or format of the data**
  - **Indicates how to read the bits - field delineation**
- **Semantics**
  - **Interprets the meaning of the bits**
  - **Knows which fields define what action**
- **Timing**
  - **When data should be sent and what**
  - **Speed at which data should be sent or speed at which it is being received.**