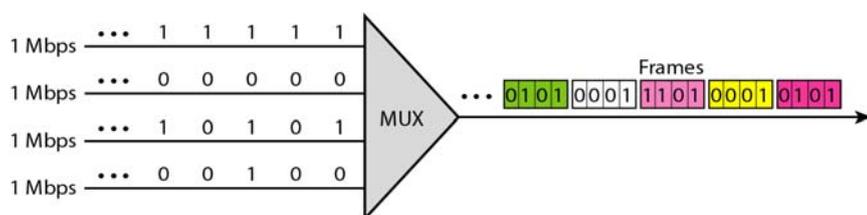


Revision Activity

- 1) What is the purpose of line coding scheme? What are the criteria of good line coding scheme? Explain the working of different line coding scheme.
- 2) An analog signal carries 4 bits per signal element. If 1000 signal elements are sent per second, find the bit rate.
- 3) An analog signal has a bit rate of 8000 bps and a baud rate of 1000 baud. How many data elements are carried by each signal element? How many signal elements do we need?
- 4) What are Amplitude Modulation, Frequency Modulation, and Phase Modulation? How much bandwidth is required for AM, FM and PM.?
- 5) What is Quadrature PSK? How QPSK can be represented by Constellation Diagrams?
- 6) Draw the constellation diagram for the following:
 - a. ASK, with peak amplitude values of 1 and 3
 - b. BPSK, with a peak amplitude value of 2
 - c. QPSK, with a peak amplitude value of 3
- 7) What is multiplexing? How multiplexing can improve efficiency of transmission?
- 8) Assume that a voice channel occupies a bandwidth of 4 kHz. We 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.
- 9) Five channels, each with a 100-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 10 kHz between the channels to prevent interference?
- 10) The Advanced Mobile Phone System (AMPS) uses two bands. The first band of 824 to 849 MHz is used for sending, and 869 to 894 MHz is used for receiving. Each user has a bandwidth of 30 kHz in each direction. How many people can use their cellular phones simultaneously?
- 11) The below figure shows synchronous TDM with 4 1Mbps data stream inputs and one data stream for the output. The unit of data is 1 bit. Find (a) the input bit duration, (b) the output bit duration, (c) the output bit rate, and (d) the output frame rate.



- 12) Explain the different techniques of Data Rate Management.

- 13) What is spread spectrum (SS)? What are the advantages of spread spectrum?
- 14) Compare Frequency Hopping Spread Spectrum (FHSS) and Direct Sequence Spread Spectrum (DSSS).
- 15) What is Pseudorandom Numbers? A pseudorandom number generator uses the following formula to create a random series:
- $$N_{i+1} = ((5 + 7N_i) \bmod 17) - 1$$
- In which N_j defines the current random number and N_{j+1} defines the next random number. The term mod means the value of the remainder when dividing $(5 + 7N_j)$ by 17. Assume the current random number is 11, generate next five random numbers.
- 16) What are different types of errors? How parity check is used to detect errors? How the impact of Burst Errors can be minimized?
- 17) The 4B/5B block coding scheme find the numbers of valid and invalid codes. How many codes are redundant?
- 18) How hamming distance helps in detecting and correcting codes?
- 19) Explain modulo 2 arithmetic. How modulo 2 arithmetic helps finding linearity and non-linearity of a codes?
- 20) Two-dimensional parity-check code helps in detecting and correcting codes?
- 21) What is Cyclic Redundancy Check (CRC) code?
- 22) Given the dataword 10011010 and the divisor 1101,
- Show the generation of the codeword at the sender site (using binary division).
 - Show the checking of the codeword at the receiver site (assume no error)
- 23) How polynomial is used to represent the codeword.
- 24) Given the dataword $X^9 + X^7 + X^3 + X^2 + 1$ and the divisor $X^5 + X^4 + X^2 + 1$,
- Show the generation of the codeword at the sender site (using binary division).
 - Show the checking of the codeword at the receiver site (assume no error)
- 25) What is CHECKSUM? How the CHECKSUM is calculated?
- 26) What is flow control and error control in data link layer?
- 27) What are the procedures and protocols used to handle flow control and error control?