DATA COMMUNICATIONS

LECTURE 5 / SIGNAL ENCODING TECHNIQUES

اللهم صل على محمد وعلى آل محمد، كما صليت على إبراهيم وعلى آل إبراهيم
إنك حميد مجيد، اللهم بارك على محمد وعلى آل محمد كما باركت على إبراهيم
وعلى آل إبراهيم إنك حميد مجيد

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[ANSWERED]

1) Both stations transmit, but only one at a time
   a) Simplex
   b) Half duplex *
   c) Full duplex
   (Slide 4)

2) Signals are transmitted in only one direction
   a) Simplex *
   b) Half duplex
   c) Full duplex
   (Slide 4)

3) Both stations may transmit simultaneously
   a) Simplex
   b) Half duplex
   c) Full duplex *
   (Slide 4)

4) The medium is carrying signals in both directions at the same time
   a) Simplex
   b) Half duplex
   c) Full duplex *
   (Slide 4)

5) One station is transmitter and the other is receiver
   a) Simplex *
   b) Half duplex
   c) Full duplex
   (Slide 4)

6) Range of frequencies contained in a signal
   a) Spectrum *
   b) Absolute Bandwidth
   c) Effective Bandwidth
   (Slide 5)

7) Narrow band of frequencies containing most energy
   a) Spectrum
   b) Absolute Bandwidth
   c) Effective Bandwidth *
   (Slide 5)

8) Width of frequency spectrum
   a) Spectrum
   b) Absolute Bandwidth *
   c) Effective Bandwidth
   (Slide 5)

9) Analog -> digital
   a) telephone
   b) codec *
   c) digital transceiver
   (Slide 6-7)

10) Analog -> Analog
   a) telephone *
   b) modem
   c) codec
   d) digital transceiver
   (Slide 6-7)

11) Digital -> Digital
   a) telephone
   b) modem
   c) codec
   d) digital transceiver *
   (Slide 6-7)

12) Digital -> Analog
   a) telephone
   b) modem *
   c) codec
   d) digital transceiver
   (Slide 6-7)

13) Encoder produces … signal
   a) analog
   b) digital *
   (Slide 8)

14) Encoder receives .. signal
a) analog
b) digital
c) Any of them *
(Slide 8)

15) Encoder receives … input/s
a) 0
b) 1 *
c) 2
d) 3
(Slide 8)

16) Modulator receives ... input/s
a) 0
b) 1
c) 2 *
d) 3
(Slide 8)

17) Modulator produces … signal
a) analog *
b) digital
(Slide 8)

18) Data signal is not processed – no amplification, no frequency change, no phase shift
a) Baseband communication *
b) Carrier communication
(Slide 9)

19) Combine an input signal $m(t)$ and a carrier signal at frequency fc to produce a signal $s(t)$ whose bandwidth is (usually) centered on fc
a) Baseband communication
b) Carrier communication *
(Slide 9)

20) input (baseband) signal is usually centered around f = 0
a) T *
b) F
(Slide 9)

21) Receiver will never be able to separate the signals
a) Baseband communication *
b) Carrier communication
(Slide 10)

22) Different signals can be separated and received correctly (by undoing the modulation, or "demodulating")
a) Baseband communication
b) Carrier communication *
(Slide 10)

23) each will transmit on a different frequency band (using the same transmission medium)
a) Baseband communication
b) Carrier communication *
(Slide 10)

24) we all transmit at the same frequency band (around f = 0)
a) Baseband communication *
b) Carrier communication
(Slide 10)

25) A carrier signal, usually with a high frequency, is used to "carry" the data (which can be either analog or digital)
a) T *
b) F
(Slide 11)

26) Data (baseband signal) "modulates" – or modifies – the carrier signal
a) T *
b) F
(Slide 11)

27) Through modulation, the carrier's amplitude, frequency or phase is adjusted to carry the modulating signal information
a) T *
b) F
(Slide 11)

28) $s(t) = A \cos[2\pi f c\ t + \theta c\ ]$
a) T *
b) F
(Slide 11)

29) the process by which some characteristic of a carrier is varied in a accordance with a modulating signal
a) Modulation *
b) Demodulation
(Slide 11)

30) Amplification is the same as attenuation
a) T
b) F *
(Slide 13 .. opposite)

31) Loss of power or loss of signal strength is called
a) amplification
b) attenuation *
(Slide 13)

32) Loss = 10 log10(P output / P input)
a) T *
b) F
(Slide 13)

33) A decrease in data rate increases bit error rate
a) T *
b) F
(Slide 14 .. was modified in the video)

34) An increase in signal to noise ratio decreases bit error rate
a) T *
b) F
(Slide 14)

35) An increase in bandwidth allows an increase in data rate
a) T *
b) F
(Slide 14)

36) frequency shifting property $m(t)\cos 2\pi f c\, t \leftrightarrow ½\,[M\,(f + fc) + M(f - fc)]$
a) T *
b) F
(Slide 14)

37) Use this mode of transmission to transmit digital data (binary zeroes and ones) over telephone networks (analog signals)
a) Digital Data to analog Signal *
b) Digital Data to digital Signal
c) Analog Data to analog Signal
d) Analog Data to digital Signal
(Slide 18)

38) Uses modem (modulator-demodulator) to convert digital data to analog signals and vice versa
a) T *
b) F
(Slide 18)

39) Modems produce signals in the voice-frequency range (300 to 3400 Hz)
a) T *
b) F
(Slide 18)

40) Modulation affects either amplitude, phase, or frequency of signal, so we have three corresponding modulation techniques
a) T *
b) F
(Slide 18)

41) Modulating analog signals by digital data can be done via
a) Amplitude Shift Keying (ASK)
b) Frequency Shift Keying (FSK)
c) Phase Shift Keying (PSK)
d) All of them *
(Slide 19)

42) Only used for optical fiber
a) Amplitude Shift Keying (ASK) *
b) Frequency Shift Keying (FSK)
c) Phase Shift Keying (PSK)
(Slide 20-24)

43) can be used more efficiently to transmit blocks of bits per frequency
a) Amplitude Shift Keying (ASK)
b) Frequency Shift Keying (FSK) *
c) Phase Shift Keying (PSK)
(Slide 20-24)

44) The two binary values (0, 1) are represented by two different amplitudes of the carrier frequency
a) Amplitude Shift Keying (ASK) *
b) Frequency Shift Keying (FSK)
c) Phase Shift Keying (PSK)
(Slide 20-24)

45) Two binary values (0, 1) are represented by two different frequencies that are near the carrier frequency
a) Amplitude Shift Keying (ASK)
b) Frequency Shift Keying (FSK) *
c) Phase Shift Keying (PSK)
(Slide 20-24)

46) Produces 0 with the binary 0
a) Amplitude Shift Keying (ASK) *
b) Frequency Shift Keying (FSK)
c) Phase Shift Keying (PSK)
(Slide 20-24)

47) $fi = fc + (2i - 1 - M)$ fd
a) Amplitude Shift Keying (ASK)
b) Frequency Shift Keying (FSK) *
c) Phase Shift Keying (PSK)
(Slide 20-24)

48) A phase shift of 180 degree is equivalent to flipping the sinusoid or multiplying it by …
a) 0
b) 1
c) -1 *
(Slide 20-24)

49) The phase of the carrier signal is shifted to represent data
a) Amplitude Shift Keying (ASK)
b) Frequency Shift Keying (FSK)
c) Phase Shift Keying (PSK) *
(Slide 20-24)

لا تنسونا من صالح دعائكم

اللهم صل على محمد وعلى آل محمد، كما صليت على إبراهيم وعلى آل إبراهيم إنك حميد مجيد، اللهم بارك على محمد وعلى آل محمد كما باركت على إبراهيم وعلى آل إبراهيم إنك حميد مجيد

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