DC(4th CSE)
Multiple Choice question With Answer
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1) In uniform quantization process

a. The step size remains same

b. Step size varies according to the values of the input signal

c. The quantizer has linear characteristics

d. Both a and c are correct

ANSWER: (d) Both a and c are correct

2) The process of converting the analog sample into discrete form is called

a. Modulation

b. Multiplexing

c. Quantization

d. Sampling

ANSWER☹c) Quantization

3) The characteristics of compressor in μ-law companding are

a. Continuous in nature

b. Logarithmic in nature

c. Linear in nature

d. Discrete in nature

ANSWER: (a) Continuous in nature

4) The modulation techniques used to convert analog signal into digital signal are

a. Pulse code modulation

b. Delta modulation

c. Adaptive delta modulation

d. All of the above

ANSWER: (d) All of the above

5) The sequence of operations in which PCM is done is

a. Sampling, quantizing, encoding

b. Quantizing, encoding, sampling

c. Quantizing, sampling, encoding

d. None of the above

ANSWER☹a) Sampling, quantizing, encoding

6) In PCM, the parameter varied in accordance with the amplitude of the modulating signal is

a. Amplitude

b. Frequency

c. Phase

d. None of the above

7) One of the disadvantages of PCM is

a. It requires large bandwidth

b. Very high noise

c. Cannot be decoded easily

d. All of the above

ANSWER: (a) It requires large bandwidth

8) The expression for bandwidth BW of a PCM system, where v is the number of bits per sample and fm is the modulating frequency, is given by

a. BW ≥ vfm

b. BW ≤ vfm

c. BW ≥ 2 vfm

d. BW ≥ ½ vfm

ANSWER: (a) BW ≥ vfm

9) The error probability of a PCM is

a. Calculated using noise and inter symbol interference

b. Gaussian noise + error component due to inter symbol interference

c. Calculated using power spectral density

d. All of the above

ANSWER: (d) All of the above

10) In Delta modulation,

a. One bit per sample is transmitted

b. All the coded bits used for sampling are transmitted

c. The step size is fixed

d. Both a and c are correct

ANSWER: (d) Both a and c are correct

11) In digital transmission, the modulation technique that requires minimum bandwidth is

a. Delta modulation

b. PCM

c. DPCM

d. PAM

ANSWER: (a) Delta modulation

12) In Delta Modulation, the bit rate is

a. N times the sampling frequency

b. N times the modulating frequency

c. N times the nyquist criteria

d. None of the above
ANSWER: (a) N times the sampling frequency

13) In Differential Pulse Code Modulation techniques, the decoding is performed by
a. Accumulator

b. Sampler

c. PLL

d. Quantizer
ANSWER: (a) Accumulator

14) DPCM is a technique
a. To convert analog signal into digital signal

b. Where difference between successive samples of the analog signals are encoded into n-bit data streams

c. Where digital codes are the quantized values of the predicted value

d. All of the above
ANSWER: (d) All of the above

15) DPCM suffers from
a. Slope over load distortion

b. Quantization noise

c. Both a & b

d. None of the above
ANSWER☹c) Both a & b

16) The noise that affects PCM
a. Transmission noise

b. Quantizing noise

c. Transit noise

d. Both a and b are correct
ANSWER: (d) Both a and b are correct

17) The factors that cause quantizing error in delta modulation are
a. Slope overload distortion

b. Granular noise

c. White noise

d. Both a and b are correct
ANSWER☹d) Both a and b are correct

18) Granular noise occurs when
a. Step size is too small

b. Step size is too large

c. There is interference from the adjacent channel

d. Bandwidth is too large
ANSWER: (b) Step size is too large

19) The crest factor of a waveform is given as –

a. 2Peak value/ rms value

b. rms value / Peak value

c. Peak value/ rms value

d. Peak value/ 2rms value
ANSWER: © Peak value/ rms value

20) The digital modulation technique in which the step size is varied according to the variation in the slope of the input is called

a. Delta modulation

b. PCM

c. Adaptive delta modulation

d. PAM
ANSWER: © Adaptive delta modulation

21) The digital modulation scheme in which the step size is not fixed is

a. Delta modulation

b. Adaptive delta modulation

c. DPCM

d. PCM
ANSWER☹b) Adaptive delta modulation

22) In Adaptive Delta Modulation, the slope error reduces and

a. Quantization error decreases

b. Quantization error increases

c. Quantization error remains same

d. None of the above
ANSWER: (b) Quantization error increases

23) The number of voice channels that can be accommodated for transmission in T1 carrier system is

a. 24

b. 32

c. 56

d. 64
ANSWER: (a) 24

24) The maximum data transmission rate in T1 carrier system is

a. 2.6 megabits per second

b. 1000 megabits per second

c. 1.544 megabits per second

d. 5.6 megabits per second
ANSWER: © 1.544 megabits per second

25) T1 carrier system is used

a. For PCM voice transmission

b. For delta modulation

c. For frequency modulated signals

d. None of the above
ANSWER: (a) For PCM voice transmission

26) Matched filter may be optimally used only for

a. Gaussian noise

b. Transit time noise

c. Flicker

d. All of the above
ANSWER☹a) Gaussian noise

27) Characteristics of Matched filter are

a. Matched filter is used to maximize Signal to noise ratio even for non Gaussian noise

b. It gives the output as signal energy in the absence of noise

c. They are used for signal detection

d. All of the above
ANSWER: (d) All of the above

28) Matched filters may be used

a. To estimate the frequency of the received signal

b. In parameter estimation problems

c. To estimate the distance of the object

d. All of the above
ANSWER: (d) All of the above

a. The process of coding multiplexer output into electrical pulses or waveforms for transmission is calledLine coding

b. Amplitude modulation

c. FSK

d. Filtering
ANSWER☹a) Line coding

29) For a line code, the transmission bandwidth must be

a. Maximum possible

b. As small as possible

c. Depends on the signal

d. None of the above
ANSWER: (b) As small as possible

30) Regenerative repeaters are used for

a. Eliminating noise

b. Reconstruction of signals

c. Transmission over long distances

d. All of the above
ANSWER☹d) All of the above

31) Scrambling of data is

a. Removing long strings of 1's and 0's

b. Exchanging of data

c. Transmission of digital data

d. All of the above
ANSWER: (a) Removing long strings of 1's and 0's

32) In polar RZ format for coding, symbol '0' is represented by

a. Zero voltage

b. Negative voltage

c. Pulse is transmitted for half the duration

d. Both b and c are correct
ANSWER: (d) Both b and c are correct

33) In a uni-polar RZ format,

a. The waveform has zero value for symbol '0'

b. The waveform has A volts for symbol '1'

c. The waveform has positive and negative values for '1' and '0' symbol respectively

d. Both a and b are correct
ANSWER: (d) Both a and b are correct

34) Polar coding is a technique in which

a. 1 is transmitted by a positive pulse and 0 is transmitted by negative pulse

b. 1 is transmitted by a positive pulse and 0 is transmitted by zero volts

c. Both a & b

d. None of the above

ANSWER: (a) 1 is transmitted by a positive pulse and 0 is transmitted by negative pulse

35) The polarities in NRZ format use

a. Complete pulse duration

b. Half duration

c. Both positive as well as negative value

d. Each pulse is used for twice the duration

ANSWER: (a) Complete pulse duration

36) The format in which the positive half interval pulse is followed by a negative half interval pulse for transmission of '1' is

a. Polar NRZ format

b. Bipolar NRZ format

c. Manchester format

d. None of the above

ANSWER: © Manchester format

37) The maximum synchronizing capability in coding techniques is present in

a. Manchester format

b. Polar NRZ

c. Polar RZ

d. Polar quaternary NRZ

ANSWER: (a) Manchester format

38) The advantage of using Manchester format of coding is

a. Power saving

b. Polarity sense at the receiver

c. Noise immunity

d. None of the above

ANSWER: (a) Power saving

39) Alternate Mark Inversion (AMI) is also known as

a. Pseudo ternary coding

b. Manchester coding

c. Polar NRZ format

d. None of the above

ANSWER☹a) Pseudo ternary coding

40) In DPSK technique, the technique used to encode bits is

a. AMI

b. Differential code

c. Uni polar RZ format

d. Manchester format

ANSWER: (b)Differential code

41) The channel capacity according to Shannon's equation is

a. Maximum error free communication

b. Defined for optimum system

c. Information transmitted

d. All of the above

ANSWER: (d) All of the above

42) For a binary symmetric channel, the random bits are given as

a. Logic 1 given by probability P and logic 0 by (1-P)

b. Logic 1 given by probability 1-P and logic 0 by P

c. Logic 1 given by probability P2 and logic 0 by 1-P

d. Logic 1 given by probability P and logic 0 by (1-P)2

ANSWER: (a) Logic 1 given by probability P and logic 0 by (1-P)

43) The technique that may be used to increase average information per bit is

a. Shannon-Fano algorithm

b. ASK

c. FSK

d. Digital modulation techniques

ANSWER: (a) Shannon-Fano algorithm

44) Code rate r, k information bits and n as total bits, is defined as

a. r = k/n

b. k = n/r

c. r = k * n

d. n = r * k

ANSWER: (a) r = k/n

45) The information rate R for given average information H= 2.0 for analog signal band limited to B Hz is

a. 8 B bits/sec

b. 4 B bits/sec

c. 2 B bits/sec

d. 16 B bits/sec

ANSWER☹b) 4 B bits/sec

46) Information rate is defined as

a. Information per unit time

b. Average number of bits of information per second

c. rH

d. All of the above

ANSWER: (d) All of the above

47) The mutual information

a. Is symmetric

b. Always non negative

c. Both a and b are correct

d. None of the above

ANSWER: © Both a and b are correct

48) The relation between entropy and mutual information is

a. I(X;Y) = H(X) – H(X/Y)

b. I(X;Y) = H(X/Y) – H(Y/X)

c. I(X;Y) = H(X) – H(Y)

d. I(X;Y) = H(Y) – H(X)

ANSWER☹a) I(X;Y) = H(X) – H(X/Y)

49) Entropy is

a. Average information per message

b. Information in a signal

c. Amplitude of signal

d. All of the above

ANSWER: (a) Average information per message

50) The memory less source refers to

a. No previous information

b. No message storage

c. Emitted message is independent of previous message

d. None of the above

ANSWER: © Emitted message is independent of previous message

51) The information I contained in a message with probability of occurrence is given by (k is constant)

a. I = k log21/P

b. I = k log2P

c. I = k log21/2P

d. I = k log21/P2

ANSWER☹a) I = k log21/P

52) The expected information contained in a message is called

a. Entropy

b. Efficiency

c. Coded signal

d. None of the above

ANSWER: (a) Entropy

53) Overhead bits are

a. Framing and synchronizing bits

b. Data due to noise

c. Encoded bits

d. None of the above

ANSWER: (a) Framing and synchronizing bits

54) ISI may be removed by using

a. Differential coding

b. Manchester coding

c. Polar NRZ

d. None of the above

ANSWER: (a) Differential coding

55) Timing jitter is

a. Change in amplitude

b. Change in frequency

c. Deviation in location of the pulses

d. All of the above

ANSWER: © Deviation in location of the pulses

56) Probability density function defines

a. Amplitudes of random noise

b. Density of signal

c. Probability of error

d. All of the above

ANSWER: (a) Amplitudes of random noise

57) Impulse noise is caused due to

a. Switching transients

b. Lightening strikes

c. Power line load switching

d. All of the above

ANSWER: (d) All of the above

58) In coherent detection of signals,

a. Local carrier is generated

b. Carrier of frequency and phase as same as transmitted carrier is generated

c. The carrier is in synchronization with modulated carrier

d. All of the above

ANSWER: (d) All of the above

59) Synchronization of signals is done using

a. Pilot clock

b. Extracting timing information from the received signal

c. Transmitter and receiver connected to master timing source

d. All of the above

ANSWER☹d) All of the above

60) Graphical representation of linear block code is known as

a. Pi graph

b. Matrix

c. Tanner graph

d. None of the above

ANSWER: © Tanner graph

61) A linear code

a. Sum of code words is also a code word

b. All-zero code word is a code word

c. Minimum hamming distance between two code words is equal to weight of any non zero code word

d. All of the above

ANSWER: (d) All of the above

62) For decoding in convolution coding, in a code tree,

a. Diverge upward when a bit is 0 and diverge downward when the bit is 1

b. Diverge downward when a bit is 0 and diverge upward when the bit is 1

c. Diverge left when a bit is 0 and diverge right when the bit is 1

d. Diverge right when a bit is 0 and diverge left when the bit is 1

ANSWER: (a)Diverge upward when a bit is 0 and diverge downward when the bit is 1

63) The code in convolution coding is generated using

a. EX-OR logic

b. AND logic

c. OR logic

d. None of the above

ANSWER: (a) EX-OR logic

64) Interleaving process permits a burst of B bits, with l as consecutive code bits and t errors when

a. $B \leq 2tl$

b. $B \geq tl$

c. $B \leq tl/2$

d. $B \leq tl$

ANSWER: (d) $B \leq tl$

65) For a (7, 4) block code, 7 is the total number of bits and 4 is the number of

a. Information bits

b. Redundant bits

c. Total bits- information bits

d. None of the above

ANSWER: (a) Information bits

66) Parity bit coding may not be used for

a. Error in more than single bit

b. Which bit is in error

c. Both a & bNone of the above

ANSWER: © Both a & b

67) Parity check bit coding is used for

a. Error correction

b. Error detection

c. Error correction and detection

d. None of the above

ANSWER: (b) Error detection

68) For hamming distance dmin and t errors in the received word, the condition to be able to correct the errors is

a. $2t + 1 \leq dmin$

b. $2t + 2 \leq dmin$

c. $2t + 1 \leq 2dmin$

d. Both a and b

ANSWER: (d) Both a and b

69) For hamming distance dmin and number of errors D, the condition for receiving invalid codeword is

a. $D \leq dmin + 1$

b. $D \leq dmin – 1$

c. $D \leq 1 – dmin$

d. $D \leq dmin$

ANSWER☹b) $D \leq dmin – 1$

70) Run Length Encoding is used for

a. Reducing the repeated string of characters

b. Bit error correction

c. Correction of error in multiple bits

d. All of the above

ANSWER: (a) Reducing the repeated string of characters

71) The prefix code is also known as

a. Instantaneous code

b. Block code

c. Convolutional code

d. Parity bit

ANSWER: (a) Instantaneous code

72) The minimum distance for unextended Golay code is

a. 8

b. 9

c. 7

d. 6

ANSWER: © 7

73) The Golay code (23,12) is a codeword of length 23 which may correct

a. 2 errors

b. 3 errors

c. 5 errors

d. 8 errors

ANSWER: (b) 3 errors

74) Orthogonality of two codes means

a. The integrated product of two different code words is zero

b. The integrated product of two different code words is one

c. The integrated product of two same code words is zero

d. None of the above

ANSWER: (a) The integrated product of two different code words is zero

75) The probability density function of a Markov process is

a. p(x1,x2,x3…….xn) = p(x1)p(x2/x1)p(x3/x2)…….p(xn/xn-1)

b. p(x1,x2,x3…….xn) = p(x1)p(x1/x2)p(x2/x3)…….p(xn-1/xn)

c. p(x1,x2,x3……xn) = p(x1)p(x2)p(x3)…….p(xn)

d. p(x1,x2,x3……xn) = p(x1)p(x2 * x1)p(x3 * x2) ..... p(xn * xn-1)

ANSWER☹a) p(x1,x2,x3…….xn) = p(x1)p(x2/x1)p(x3/x2)..... p(xn/xn-1)