

# Multiple Choice Questions On **DATA COMPRESSION**



By  
*Mr. Sandeep Vishwakarma*  
*Assistant Professor*  
*Dr. A.P.J. Abdul Kalam*  
*Technical University, Lucknow*



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## Multiple Choice Questions on Data Compression

1. Data compression means to \_\_\_\_\_ the file size.

- (A) Increase
- (B) Decrease
- (C) Can't say
- (D) None of the above

Answer

Correct option is B

2. Data compression and encryption both work on binary code.

- (A) False
- (B) True

Answer

Correct option is B

3. What is compression?

- (A) To compress something by pressing it very hardly
- (B) To minimize the time taken for a file to be downloaded
- (C) To reduce the size of data to save space
- (D) To convert one file to another

Answer

Correct option is C

4. Data compression usually works by \_\_\_\_\_.

- (A) Deleting random bits data
- (B) Finding repeating patterns

Answer

Correct option is B

5. Why data compressed?

- (A) To optimise the data
- (B) To reduce secondary storage space
- (C) To reduce packet congestion on networks
- (D) Both (B) and (C)

Answer

Correct option is D

6. Which is a type of data compression?

- (A) Resolution
- (B) Zipping
- (C) Inputting
- (D) Caching

Answer

Correct option is B

7. Data compression involves

- (A) Compression only
- (B) Reconstruction only
- (C) Both compression and reconstruction
- (D) None of the above

Answer

Correct option is C

8. Based on the requirements of reconstruction, data compression schemes can be divided into \_\_\_\_\_ broad classes.

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- (A) 3
- (B) 4
- (C) 2
- (D) 5

Answer

Correct option is C

9. \_\_\_\_\_ compression is the method which eliminate the data which is not noticeable and \_\_\_\_\_ compression does not eliminate the data which is not noticeable.

- (A) Lossless, lossy
- (B) Lossy, lossless
- (C) None of these

Answer

Correct option is B

10. \_\_\_\_\_ compression is generally used for applications that cannot tolerate any difference between the original and reconstructed data.

- (A) Lossy
- (B) Lossless
- (C) Both
- (D) None of these

Answer

Correct option is B

11. What is compression ratio?

- (A) The ratio of the number of bits required to represent the data before compression to the number of bits required to represent the data after compression.
- (B) The ratio of the number of bits required to represent the data after compression to the number of bits required to represent the data before compression.
- (C) The ratio of the number of bits required to represent the data after reconstruction to the number of bits required to represent the data before compression.
- (D) The ratio of the number of bits required to represent the data before reconstruction to the number of bits required to represent the data after reconstruction.

Answer

Correct option is A

12. Suppose storing an image made up of a square array of  $256 \times 256$  pixels requires 65,536 bytes. The image is compressed and the compressed version requires 16,384 bytes. Then compression ratio is \_\_\_\_\_.

- (A) 1:4
- (B) 4:1
- (C) 1:2
- (D) 2:1

Answer

Correct option is B

13. Lossy techniques are generally used for the compression of data that originate as analog signals, such as

- (A) Speech
- (B) Video
- (C) Both
- (D) None of these

Answer

Correct option is C

14. If fidelity or quality of a reconstruction is \_\_\_\_\_, then the difference between the reconstruction and the original is \_\_\_\_\_.

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- (A) High, small
- (B) Small, small
- (C) High, high
- (D) None of the above

Answer

Correct option is D

15. The development of data compression algorithms for a variety of data can be divided into \_\_\_\_\_ phases.

- (A) 2
- (B) 3
- (C) 4
- (D) 5

Answer

Correct option is A

16. Which of the following is true of lossy and lossless compression techniques?

- (A) Lossless compression is only used in situations where lossy compression techniques can't be used
- (B) Lossy compression is best suited for situations where some loss of detail is tolerable, especially if it will not be detectable by a human
- (C) Both lossy and lossless compression techniques will result in some information being lost from the original file
- (D) Neither lossy nor lossless compression can actually reduce the number of bits needed to represent a file

Answer

Correct option is B

17. Which of the following would not be suitable for Lossy Compression?

- (A) Speech
- (B) Video
- (C) Text
- (D) Image

Answer

Correct option is C

18. Which of the following are not in a compressed format?

- (A) MP3
- (B) Bitmap
- (C) MPEG
- (D) JPEG

Answer

Correct option is B

19. Information theory was given by

- (A) Claude von Regan
- (B) Claude Elwood Shannon
- (C) Claude Monet
- (D) Claude Debussy

Answer

Correct option is B

20. The unit of information depends on the base of the log. If we use log base 2, the unit is \_\_\_\_\_; if we use log base e, the unit is \_\_\_\_\_; and if we use log base 10, the unit is \_\_\_\_\_.

- (A) Hartleys, nats, bits
- (B) Hartleys, bits, nats
- (C) Bits, nats, hartleys
- (D) Bits, hartleys, nats

## Multiple Choice Questions on Data Compression

Answer

Correct option is C

21. According to Claude Elwood Shannon's second theorem, it is not feasible to transmit information over the channel with \_\_\_\_\_ error probability, although by using any coding technique.

- (A) Large
- (B) May be large or small
- (C) Unpredictable
- (D) Small

Answer

Correct option is D

22. The essential condition/s for a good error control coding technique?

- (A) Better error correcting capability
- (B) Maximum transfer of information in bits/sec
- (C) Faster coding & decoding methods
- (D) All of the above

Answer

Correct option is D

23. The prefix code is also called as

- (A) Block code
- (B) Convolutional code
- (C) Parity code
- (D) Instantaneous code

Answer

Correct option is D

24. Self information should be \_\_\_\_\_.

- (A) Negative
- (B) Positive
- (C) Both
- (D) None of these

Answer

Correct option is B

25. A code in which no codeword is a prefix to another codeword is called as

- (A) Prefix cod
- (B) Parity code
- (C) Convolutional code
- (D) Block code

Answer

Correct option is A

26. The set of binary sequences is called a \_\_\_\_\_, and the individual members of the set are called \_\_\_\_\_.

- (A) Codewords, code
- (B) Code, codewords
- (C) None of these

Answer

Correct option is B

27. Full form of ASCII.

- (A) American Standard Code for Information Intercaste
- (B) American Standard Codewords for Information Interchange

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- (C) American Standard Code for Information Interchange
- (D) American System Code for Information Interchange

Answer

Correct option is C

28. Composite source models is a combination or composition of several sources. In which how many source being active at any given time?

- (A) All
- (B) Only one
- (C) Only first three
- (D) None of these

Answer

Correct option is B

29. For models used in lossless compression, we use a specific type of Markov process called a

- (A) Continous time Markov chain
- (B) Discrete time Markov chain
- (C) Constant time Markov chain
- (D) None of the above

Answer

Correct option is B

30. Markov model is often used when developing coding algorithms for

- (A) Speech
- (B) Image
- (C) Both
- (D) None of these

Answer

Correct option is C

31.Which of the following compression type is supported by SQL Server 2014?

- (A) Row
- (B) Column
- (C) Both row and column
- (D) None of the mentioned

Answer

Correct option is C

32.Point out the correct statement.

- (A) The details of data compression are subject to change without notice in service packs or subsequent releases
- (B) Compression is not available for system tables
- (C) If you specify a list of partitions or a partition that is out of range, an error will be generated
- (D) All of the mentioned

Answer

Correct option is D

33. In which type of Data Compression, the integrity of the data is preserved?

- (A) Lossy Compression
- (B) Lossless Compression
- (C) Both of the above

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- (D) None of the above

Answer

Correct option is B

34. Which of the following are Lossless methods?

- (A) Run-length
- (B) Huffman
- (C) Lempel Ziv
- (D) All of the above

Answer

Correct option is D

35. Which of the following are lossy methods?

- (A) JPEG
- (B) MPEG
- (C) MP3
- (D) All of the above

Answer

Correct option is D

36. In how many parts we can divide audio and video services into broad categories?

- (A) Two
- (B) Three
- (C) Four
- (D) None of the above

Answer

Correct option is B

37. Sequence of code assigned is called

- (A) code word
- (B) word
- (C) byte
- (D) nibble

Answer

Correct option is A

Unit-II

1. Huffman codes are \_\_\_\_\_ codes and are optimum for a given model (set of probabilities).
- (A) Parity
  - (B) Prefix
  - (C) Convolutional code
  - (D) Block code

Answer

Correct option is B

2. The Huffman procedure is based on observations regarding optimum prefix codes, which is/are
- (A) In an optimum code, symbols that occur more frequently (have a higher probability of occurrence) will have shorter codewords than symbols that occur less frequently.
  - (B) In an optimum code, the two symbols that occur least frequently will have the same length
  - (C) Both (A) and (B)
  - (D) None of these

Answer

Correct option is C

3. The best algorithms for solving Huffman codes

- (A) Brute force algorithm
- (B) Divide and conquer algorithm
- (C) Greedy algorithm
- (D) Exhaustive search

Answer

Correct option is C

4. How many printable characters does the ASCII character set consists of?

- (A) 128
- (B) 100
- (C) 98
- (D) 90

Answer

Correct option is B

5. The difference between the entropy and the average length of the Huffman code is called

- (A) Rate
- (B) Redundancy
- (C) Power
- (D) None of these

Answer

Correct option is B

6. Unit of redundancy is

- (A) bits/second
- (B) symbol/bits
- (C) bits/symbol
- (D) none of these

Answer

Correct option is C

7. The redundancy is zero when
- (A) The probabilities are positive powers of two
  - (B) The probabilities are negative powers of two
  - (C) Both
  - (D) None of the above

Answer

Correct option is B

8. Which bit is reserved as a parity bit in an ASCII set?

- (A) Sixth
- (B) Seventh
- (C) Eighth
- (D) Ninth

Answer

Correct option is C

9. Bits are needed for standard encoding if the size of the character set is X

- (A)  $X+1$
- (B)  $\log(X)$
- (C)  $X^2$
- (D)  $2X$

Answer

Correct option is B

10. In Huffman coding, data in a tree always occur in

- (A) Leaves
- (B) Roots
- (C) Left sub trees
- (D) None of these

Answer

Correct option is A

11. An optimal code will always be present in a full tree.

- (A) True
- (B) False

Answer

Correct option is A

12. Running time of the Huffman encoding algorithm is

- (A)  $O(N\log(C))$
- (B)  $O(C\log(C))$
- (C)  $O(C)$
- (D)  $O(\log(C))$

Answer

Correct option is B

13. Running time of the Huffman algorithm, if its implementation of the priority queue is done using linked lists

- (A)  $O(\log(C))$
- (B)  $O(C\log(C))$
- (C)  $O(C^2)$
- (D)  $O(C)$

## Multiple Choice Questions on Data Compression

Answer

Correct option is C

14. The unary code for a positive integer n is simply n \_\_\_\_ followed by a \_\_\_\_.

- (A) zero, ones
- (B) ones, zero
- (C) None of these

Answer

Correct option is B

15. The unary code for 4 is \_\_\_\_\_.

- (A) 11100
- (B) 11110
- (C) 00001
- (D) 00011

Answer

Correct option is B

16. In the Tunstall code, all codewords are of \_\_\_\_\_ length. However, each codeword represents a \_\_\_\_\_ number of letters.

- (A) different, equal
- (B) equal, different
- (C) none of these

Answer

Correct option is B

17. Tunstall coding is a form of entropy coding used for

- (A) Lossless data compression
- (B) Lossy data compression
- (C) Both
- (D) None of these

Answer

Correct option is A

18. The main advantage of a Tunstall code is that

- (A) Errors in codewords do not propagate
- (B) Errors in codewords propagate
- (C) The disparity between frequencies
- (D) None of these

Answer

Correct option is A

19. Applications of Huffman Coding

- (A) Text compression
- (B) Audio compression
- (C) Lossless image compression
- (D) All of the above

Answer

Correct option is D

20. An alphabet consist of the letters A, B, C and D. The probability of occurrence is  $P(A) = 0.4$ ,  $P(B) = 0.1$ ,  $P(C) = 0.2$  and  $P(D) = 0.3$ . The Huffman code is

(A) A = 0

B = 111

C = 110

D = 10

(B) A = 0

B = 11

C = 10

D = 111

(C) A = 0

B = 111

C = 11

D = 101

(D) A = 01

B = 111

C = 110

D = 10

Answer

Correct option is A

21. The basic idea behind Huffman coding is to

(A) compress data by using fewer bits to encode fewer frequently occurring characters

(B) compress data by using fewer bits to encode more frequently occurring characters

(C) compress data by using more bits to encode more frequently occurring characters

(D) expand data by using fewer bits to encode more frequently occurring characters

Answer

Correct option is B

22. Huffman coding is an encoding algorithm used for

(A) lossless data compression

(B) broadband systems

(C) files greater than 1 Mbit

(D) lossy data compression

Answer

Correct option is A

23. A Huffman encoder takes a set of characters with fixed length and produces a set of characters of

(A) random length

(B) fixed length

(C) variable length

(D) constant length

Answer

Correct option is C

24. A Huffman code: A = 1, B = 000, C = 001, D = 01 , P(A) = 0.4, P(B) = 0.1, P(C) = 0.2, P(D) = 0.3

The average number of bits per letter is

(A) 8.0 bit

(B) 2.1 bit

(C) 2.0 bit

(D) 1.9 bit

Answer

Correct option is C

25. Which of the following is not a part of the channel coding?

- (A) rectangular code
- (B) Checksum checking
- (C) Hamming code
- (D) Huffman code

Answer

Correct option is D

26. Which of the following is the first phase of JPEG?

- (A) DCT Transformation
- (B) Quantization
- (C) Data Compression
- (D) None of the above

Answer

Correct option is D

27. Which type of method is used is used to compress data made up of combination of symbols?

- (A) Run- length encoding
- (B) Huffman encoding
- (C) Lempel Ziv encoding
- (D) JPEG encoding

Answer

Correct option is A

28. How many passes does lossy compression makes frequently?

- (A) One pass
- (B) Two pass
- (C) Three pass
- (D) Four pass

Answer

Correct option is B

29. Information is the

- (A) data
- (B) meaningful data
- (C) raw data
- (D) Both A and B

Answer

Correct option is B

Unit-III

1. In dictionary techniques for data compaction, which approach of building dictionary is used for the prior knowledge of probability of the frequently occurring patterns?

- (A) Adaptive dictionary
- (B) Static dictionary
- (C) Both
- (D) None of the above

Answer

Correct option is B

2. If the probability of encountering a pattern from the dictionary is  $p$ , then the average number of bits per pattern  $R$  is given by

- (A)  $R=21-12p$
- (B)  $R=9-p$
- (C)  $R=21-p$
- (D)  $R=12-p$

Answer

Correct option is A

3. Static dictionary –

- (A) permanent
- (B) sometimes allowing the addition of strings but no deletions
- (C) allowing for additions and deletions of strings as new input symbols are being read
- (D) Both (A) and (B)
- (E) Both (A) and (C)

Answer

Correct option is D

4. Adaptive dictionary –

- (A) holding strings previously found in the input stream
- (B) sometimes allowing the addition of strings but no deletions
- (C) allowing for additions and deletions of strings as new input symbols are being read
- (D) Both (A) and (B)
- (E) Both (A) and (C)

Answer

Correct option is E

5. LZ77 and LZ78 are the two \_\_\_\_\_ algorithms published in papers by Abraham Lempel and Jacob Ziv in 1977 and 1978

- (A) Lossy data compression
- (B) Lossless data compression
- (C) Both
- (D) None of the above

Answer

Correct option is B

6. Deflate = \_\_\_\_\_

- (A) LZ78 + Huffman
- (B) LZ77 + Huffman
- (C) LZW + Huffman
- (D) None of these

Answer

Correct option is B

7. Full form of GIF.

- (A) Graphics Interchange Form
- (B) Graphics Inter Format
- (C) Graphics Interchange Format
- (D) Graphics Interact Format

Answer

Correct option is C

8. LZ78 has \_\_\_\_\_ compression but very \_\_\_\_\_ decompression than LZ77.

- (A) fast, slow
- (B) slow, fast
- (C) None of these

Answer

Correct option is B

9. Compression packages which use an LZ77-based algorithm followed by a variable-length coder.

- (A) PKZip
- (B) Zip
- (C) PNG
- (D) All of the above

Answer

Correct option is D

10. Application of LZW

- (A) GIF
- (B) Zip
- (C) PNG
- (D) All of the above

Answer

Correct option is A

11. Algorithm used for solving temporal probabilistic reasoning

- (A) Depth-first search
- (B) Hidden markov model
- (C) Hidden markov model
- (D) Breadth-first search

Answer

Correct option is C

12. Where does the Hidden Markov Model is used?

- (A) Understanding of real world
- (B) Speech recognition
- (C) Both
- (D) None of the above

Answer

Correct option is B

13. A coding scheme that takes advantage of long runs of identical symbols is called as

- (A) Move-to-front coding
- (B) Binary coding
- (C) Huffman coding
- (D) Move-to-back coding

## Multiple Choice Questions on Data Compression

Answer

Correct option is A

14. The idea with wavelets is to represent a complicated function by

- (A) simple basic functions
- (B) sinus functions
- (C) lines
- (D) square functions

Answer

Correct option is A

15. In a typical picture, most pixels will be

- (A) equal
- (B) very different to their neighbors
- (C) bright
- (D) very similar to their neighbors

Answer

Correct option is C

16. Without losing quality, JPEG-2000 can achieve compression ratios of

- (A) 2:1
- (B) 200:1
- (C) 2000:1
- (D) 20:1

Answer

Correct option is B

17. The best visual compression quality is achieved using

- (A) Fourier transform
- (B) Wavelets
- (C) DCT
- (D) Dolby

Answer

Correct option is B

18. Which is the image processing technique used to improve the quality of image for human viewing?

- (A) compression
- (B) enhancement
- (C) restoration
- (D) analysis

Answer

Correct option is B

19. To remove archival compression and restore the data to column store compression

- (A) Use ALTER TABLE
- (B) Use ALTER COLUMN
- (C) Use ALTER DATABASE
- (D) All of the mentioned

Answer

## Multiple Choice Questions on Data Compression

Correct option is A

20. Point out the wrong statement.

- (A) You can enable or disable ROW or PAGE compression in online state only
- (B) When you are compressing indexes, leaf-level pages can be compressed with both row and page compression
- (C) Non-leaf-level pages do not receive page compression
- (D) None of the mentioned

Answer

Correct option is A

21. What is image?

- (A) Picture
- (B) Matrix of pixel
- (C) Collection of pixel
- (D) All of these

Answer

Correct option is D

22. An image transmitted using wireless network:

- (A) corrupted as a result of lighting or other atmospheric disturbance.
- (B) non-corrupted as a result of lighting or other atmospheric disturbance.
- (C) corrupted as a result of pixel disturbance.
- (D) none of above

Answer

Correct option is A

Unit-IV

1. Which of the following characterizes a quantizer

- (A) Quantization results in a non-reversible loss of information
- (B) A quantizer always produces uncorrelated output samples
- (C) The output of a quantizer has the same entropy rate as the input
- (D) None of the above

Answer

Correct option is A

2. What is the signal-to-noise ratio (SNR)?

- (A) The ratio of the average squared value of the source output and the squared error of the source output
- (B) The ratio of the average squared value of the source output and the mean squared error of the source output
- (C) The ratio of the average squared value of the source output and the absolute difference measure of the source output
- (D) None of the above

Answer

Correct option is B

3. The output signal of a scalar quantizer has property

- (A) The output is a discrete signal with a finite symbol alphabet
- (B) The output is a discrete signal with a countable symbol alphabet (but not necessarily a finite symbol alphabet)
- (C) The output signal may be discrete or continuous
- (D) None of the above

Answer

Correct option is B

4. What is a Lloyd quantizer?

- (A) For a given source, the Lloyd quantizer is the best possible scalar quantizer in ratedistortion sense. That means, there does not exist any other scalar quantizer that yields a smaller distortion at the same rate.
- (B) The output of a Lloyd quantizer is a discrete signal with a uniform pmf
- (C) Both (A) and (B)
- (D) A Lloyd quantizer is the scalar quantizer that yields the minimum distortion for a given source and a given number of quantization intervals.

Answer

Correct option is D

5. Which of the following statement is correct for comparing scalar quantization and vector quantization?

- (A) Vector quantization improves the performance only for sources with memory. For iid sources, the best scalar quantizer has the same efficiency as the best vector quantizer
- (B) Vector quantization does not improve the rate-distortion performance relative to scalar quantization, but it has a lower complexity
- (C) By vector quantization we can always improve the rate-distortion performance relative to the best scalar quantizer
- (D) All of the above

Answer

Correct option is C

## Multiple Choice Questions on Data Compression

6. If  $\{x\}_n$  is the source output and  $\{y\}_n$  is the reconstructed sequence, then the squared error measure is given by

- (A)  $d(x, y) = (y - x)^2$
- (B)  $d(x, y) = (x - y)^2$
- (C)  $d(x, y) = (y + x)^2$
- (D)  $d(x, y) = (x - y)^4$

Answer

Correct option is B

7. If  $\{x\}_n$  is the source output and  $\{y\}_n$  is the reconstructed sequence, then the absolute difference measure is given by

- (A)  $d(x, y) = |y - x|$
- (B)  $d(x, y) = |x - y|$
- (C)  $d(x, y) = |y + x|$
- (D)  $d(x, y) = |x - y|^2$

Answer

Correct option is B

8. The process of representing a \_\_\_\_\_ possibly infinite set of values with a much \_\_\_\_\_ set is called quantization

- (A) Large, smaller
- (B) Smaller, large
- (C) None of these

Answer

Correct option is A

9. The set of inputs and outputs of a quantizer can be

- (A) Only scalars
- (B) Only vectors
- (C) Scalars or vectors
- (D) None of these

Answer

Correct option is C

10. Which of the following is/are correct for uniform quantizer

- (A) The simplest type of quantizer is the uniform quantizer
- (B) All intervals are the same size in the uniform quantizer, except possibly for the two outer intervals
- (C) The decision boundaries are spaced evenly
- (D) All of the above

Answer

Correct option is D

11. If a Zero is assigned a decision level, then what is the type of quantizer?

- (A) A midtread quantizer
- (B) A midrise quantizer
- (C) A midtreat quantizer
- (D) None of the above

Answer

Correct option is B

12. If a Zero is assigned a quantization level, then what is the type of quantizer?

- (A) A midtread quantizer
- (B) A midrise quantizer
- (C) A midtreat quantizer
- (D) None of the above

## Multiple Choice Questions on Data Compression

Answer

Correct option is A

13. The main approaches to adapting the quantizer parameters:

- (A) An off-line or forward adaptive approach
- (B) An on-line or backward adaptive approach
- (C) Both
- (D) None of the above

Answer

Correct option is C

14. Uniform quantizer is also called as

- (A) Low rise quantizer
- (B) High rise quantizer
- (C) Mid rise quantizer
- (D) None of the above

Answer

Correct option is C

15. Non uniform quantizer \_\_\_\_\_ distortion.

- (A) Decrease
- (B) Increase
- (C) Doesn't change
- (D) None of the above

Answer

Correct option is A

16. The spectral density of white noise is \_\_\_\_\_.

- (A) Poisson
- (B) Exponential
- (C) Uniform
- (D) Gaussian

Answer

Correct option is C

17. Which audio/video refers to on-demand requests for compressed audio/video files?

- (A) Streaming live
- (B) Streaming stored
- (C) Interactive
- (D) None of the above

Answer

Correct option is B

18. According to Nyquist theorem, how many times the highest frequency we need to sample an analog signal?

- (A) Three
- (B) Two
- (C) Four
- (D) None of the above

Answer

Correct option is B

19. Which encoding is based on the science of psychoacoustics, which is the study of how people perceive sound?

- (A) Predictive
- (B) Perceptual
- (C) Both of the above
- (D) None of the above

Answer

Correct option is B

20. SDH uses \_\_\_\_\_ to measure block errors.

- (A) CRC
- (B) Rectangular code
- (C) bit-interleaved parity (BIP )
- (D) Simple parity check

21. The minimum sampling rate is called?

- (A) Data rate
- (B) symbol rate
- (C) Nyquist rate
- (D) None of the above

Answer

Correct option is C

22. Spread spectrum is used for

- (A) Encrypting signal
- (B) Hiding signal
- (C) Encrypting & Hiding signal
- (D) None of the mentioned

Answer

Correct option is C

23. Which is a quantization process?

- (A) Rounding
- (B) Truncation
- (C) Rounding & Truncation
- (D) None of the mentioned

Answer

Correct option is C

24. Quantization is a \_\_\_\_\_ process.

- (A) Non linear
- (B) Reversible
- (C) Non linear & Reversible
- (D) None of the mentioned

Answer

Correct option is C

25. The mutual information between a pair of events is

- (A) Positive
- (B) Negative
- (C) Zero
- (D) All of the mentioned

Answer

Correct option is D

26. The SNR value can be increased by \_\_\_\_\_ the number of levels.

## Multiple Choice Questions on Data Compression

- (A) Increasing
- (B) Decreasing
- (C) Does not depend on
- (D) None of the mentioned

Answer

Correct option is A

27. 1 bit quantizer is a

- (A) Hard limiter
- (B) Two level comparator
- (C) Hard limiter & Two level comparator
- (D) None of the mentioned

Answer

Correct option is C

28. The low pass filter at the output end of delta modulator depends on

- (A) Step size
- (B) Quantization noise
- (C) Bandwidth
- (D) None of the mentioned

Answer

Correct option is C

29. Quantization Matrix in JPEG compression was introduced because

- (A) It is computationally more efficient to work with matrix than with scalar quantization;
- (B) It allows better entropy encoding due to DC and AC coefficient distribution in the 8x8 block matrix;
- (C) It allows better differentiation of DC and AC coefficients in the 8x8 block matrix than a scalar quantization;

Answer

Correct option is C

30. What property has the output signal of a scalar quantizer

- (A) The output is a discrete signal with a countable symbol alphabet (but not necessarily a finite symbol alphabet).
- (B) The output is a discrete signal with a finite symbol alphabet.
- (C) The output signal may be discrete or continuous.

Answer

Correct option is A

Unit-V

1. Characteristic of a vector quantizer

- (A) Multiple quantization indexes are represented by one codeword
- (B) Each input symbol is represented by a fixed-length codeword
- (C) Multiple input symbols are represented by one quantization index
- (D) All of the above

Answer

Correct option is C

2. Vector quantization is rarely used in practical applications, why?

- (A) The coding efficiency is the same as for scalar quantization
- (B) The computational complexity, in particular for the encoding, is much higher than in scalar quantization and a large codebook needs to be stored
- (C) It requires block Huffman coding of quantization indexes, which is very complex
- (D) All of the above

Answer

Correct option is B

3. Let N represent the dimension of a vector quantizer. What statement about the performance of the best vector quantizer with dimension N is correct?

- (A) For N approaching infinity, the quantizer performance asymptotically approaches the rate-distortion function (theoretical limit)
- (B) By doubling the dimension N, the bit rate for the same distortion is halved
- (C) The vector quantizer performance is independent of N
- (D) All of the above

Answer

Correct option is A

4. Which of the following is/are correct for advantage of vector quantization over scalar quantization

- (A) Vector Quantization can lower the average distortion with the number of reconstruction levels held constant
- (B) Vector Quantization can reduce the number of reconstruction levels when distortion is held constant
- (C) Vector Quantization is also more effective than Scalar Quantization When the source output values are not correlated
- (D) All of the above

Answer

Correct option is D

5. Vector quantization is used for

- (A) Lossy data compression
- (B) Lossy data correction
- (C) Pattern recognition
- (D) All of the above

Answer

Correct option is D

6. The Linde–Buzo–Gray algorithm is a \_\_\_\_\_ quantization algorithm to derive a good codebook.

- (A) Scalar
- (B) Vector
- (C) Both
- (D) None of the above

Answer

## Multiple Choice Questions on Data Compression

Correct option is B

7. Vector quantization is used in

- (A) Video coding
- (B) Audio coding
- (C) Speech coding
- (D) All of the above

Answer

Correct option is C

8. What are process(Techniques) used in video coding?

- (A) Partition of frames into macro blocks
- (B) Form of Vector Quantization
- (C) Both (A) & (B)
- (D) None of these

Answer

Correct option is C

9. The process of converting the analog sample into discrete form is called

- (A) Modulation
- (B) Multiplexing
- (C) Quantization
- (D) Sampling

Answer

Correct option is C

10. 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

Correct option is A

11. To convert a continuous sensed data into Digital form, which of the following is required?

- (A) Sampling
- (B) Quantization
- (C) Both Sampling and Quantization
- (D) Neither Sampling nor Quantization

Answer

Correct option is C

12. For a continuous image  $f(x, y)$ , Quantization is defined as

- (A) Digitizing the coordinate values
- (B) Digitizing the amplitude values
- (C) All of the mentioned
- (D) None of the mentioned

Answer

Correct option is B

13. The resulting image of sampling and quantization is considered a matrix of real numbers.

## Multiple Choice Questions on Data Compression

By what name(s) the element of this matrix array is called

- (A) Image element or Picture element
- (B) Pixel or Pel
- (C) All of the mentioned
- (D) None of the mentioned

Answer

Correct option is C

14. Which conveys more information?

- (A) High probability event
- (B) Low probability event
- (C) High & Low probability event
- (D) None of the mentioned

Answer

Correct option is B

15. The probability density function of the envelope of narrow band noise is

- (A) Uniform
- (B) Gaussian
- (C) Rayleigh
- (D) Rician

Answer

Correct option is B

16. Which model is known as ignorance model?

- (A) Physical model
- (B) Markov model
- (C) Probability model
- (D) Composite Source Model

Answer

Correct option is C

17. Shannons theorem is also called

- (A) noiseless coding theorem
- (B) noisy coding theorem
- (C) coding theorem
- (D) noiseless theorem

Answer

Correct option is A

18. Transform coding, vector quantization are examples for \_\_\_\_\_

- (A) Pixel
- (B) compression
- (C) Transmission
- (D) Lossy compression

Answer

Correct option is D

19. Entropy Coding is an \_\_\_\_\_

- (A) Lossless
- (B) Lossy
- (C) 0
- (D) None

Answer

Correct option is A

20. \_\_\_\_\_ is normally used for the data generated by scanning the documents, fax machine, typewriters etc.

- (A) Huffman Coding
- (B) Transformation Coding
- (C) Vector Quantization
- (D) Runlength Encoding

Answer

Correct option is D

21. Compression Technique used in Image Video is

- (A) Huffman Coding
- (B) Transformation Coding
- (C) Entropy Coding
- (D) Differential Encoding

Answer

Correct option is B

22. Compression Technique used in Audio is

- (A) Differential Encoding
- (B) Transformation Encoding
- (C) Entropy Coding
- (D) Differential & Transformation Encoding

Answer

Correct option is D

23. Expansion of LZ Coding is

- (A) Lossy
- (B) Lossless
- (C) Lempel-ziv-welsh
- (D) Lempel-ziv

Answer

Correct option is D

24. Expansion of LZW Coding is

- (A) Lossy
- (B) Lossless

Multiple Choice Questions on Data Compression

- (C) Lempel-ziv
- (D) Lempel-ziv-welsh

Answer

Correct option is D

### Practice Question

(Option In bold font is Answer )

1. What is compression?
  - a) To convert one file to another
  - b) To reduce the size of data to save space**
  - c) To minimise the time taken for a file to be download
  - d) To compress something by pressing it hard
2. What does Lossy Compression do to files?
  - a) Increases the file size and keeps the same quality
  - b) Eliminates no information at all
  - c) Decreases the file size and keeps the same quality
  - d) Eliminates unnecessary information in a file to reduce file size**
3. What is Lossless Compression?
  - a) No information is lost but file size is increased
  - b) There is no loss of information at all after compression**
  - c) Files which have the exact same data after compression
  - d) Compression involves an algorithm
4. What type of compression would you use to compress a video?
  - a) Lossy**
  - b) Lossless
5. When Lossy compression is used data is lost?
  - a) True**
  - b) False
6. Which of the following are not in a compressed format?
  - a) JPEG
  - b) MPEG
  - c) Bitmap**
  - d) MP3
7. Uncompressed audio and video files require less memory than compressed files....
  - a) True
  - b) False**
8. What would you use compression for?
  - a) Making an image file smaller**
  - b) Modifying an image
9. Which of the following would not be suitable for Lossy Compression?

- a) Images
- b) Sounds
- c) Videos
- d) Text**

10. Compression in general makes it \_\_\_\_\_ to send, upload and stream data

- a) Quicker**
- b) Slower

11. Lossless compression permanently deletes the data

- a) True
- b) False**

12. Lossy compression would be suitable for text files

- a) True
- b) False**

13. Compression looks for \_\_\_\_\_ data

- a) Unnecessary
- b) Repeated**

14. How many bits make up one byte?

- a) 4
- b) 16
- c) 8**
- d) 10

15. Which of the following is true of lossy and lossless compression techniques?

- a) Lossless compression throws away unimportant details that a human being will likely be unable to detect.
- b) Lossy compression is only possible on files that are at least one gigabyte in size before compression.
- c) Lossy compression techniques are no longer commonly used.
- d) Lossless compression is fully reversible, meaning the original file can be recreated bit for bit.**

16. Which of the following is true of lossy and lossless compression techniques?

- a) Both lossy and lossless compression techniques will result in some information being lost from the original file.
- b) Neither lossy nor lossless compression can actually reduce the number of bits needed to represent a file.
- c) Lossless compression is only used in situations where lossy compression techniques can't be used.
- d) Lossy compression is best suited for situations where some loss of detail is tolerable, especially if it will not be detectable by a human.**

17. data compression algorithm that allows the original data to be perfectly reconstructed from the compressed data.

- a) lossy compression
- b) lossless compression**

18. Compression looks for \_\_\_\_\_ data

- a) Unnecessary
- b) Repeated**

19. The \_\_\_\_\_ codec from Google provides modest compression ratios.

- a) Snapcheck
- b) Snappy**
- c) FileCompress
- d) None of the mentioned

20. Point out the correct statement.

- a) Snappy is licensed under the GNU Public License (GPL)
- b) BgCIK needs to create an index when it compresses a file
- c) The Snappy codec is integrated into Hadoop Common, a set of common utilities that supports other Hadoop subprojects**
- d) None of the mentioned

21. Which of the following compression is similar to Snappy compression?

- a) LZO**
- b) Bzip2
- c) Gzip
- d) All of the mentioned

22. Which of the following supports splittable compression?

- a) LZO**
- b) Bzip2
- c) Gzip
- d) All of the mentioned

23. Point out the wrong statement.

- a) From a usability standpoint, LZO and Gzip are similar**
- b) Bzip2 generates a better compression ratio than does Gzip, but it's much slower
- c) Gzip is a compression utility that was adopted by the GNU project
- d) None of the mentioned

24. Which of the following is the slowest compression technique?

- a) LZO
- b) Bzip2**
- c) Gzip
- d) All of the mentioned

25. Gzip (short for GNU zip) generates compressed files that have a \_\_\_\_\_ extension.

- a) .gzip
- b) .gz**
- c) .gzb
- d) .g

26. Which of the following is based on the DEFLATE algorithm?

- a) LZO
- b) Bzip2
- c) Gzip**
- d) All of the mentioned

27. \_\_\_\_\_ typically compresses files to within 10% to 15% of the best available techniques.

- a) LZO
- b) Bzip2**
- c) Gzip
- d) All of the mentioned

28. The LZO compression format is composed of approximately \_\_\_\_\_ blocks of compressed data.

- a) 128k
- b) 256k**
- c) 24k
- d) 36k

29. Digitizing the image intensity amplitude is called

- A. sampling
- B. quantization**
- C. framing
- D. Both A and B

30. Compressed image can be recovered back by

- A. image enhancement
- B. image decompression**
- C. image contrast
- D. image equalization

31. Which of the following algorithms is the best approach for solving Huffman codes?

- a) exhaustive search
- b) greedy algorithm**
- c) brute force algorithm
- d) divide and conquer algorithm

32. The type of encoding where no character code is the prefix of another character code is called?

- a) optimal encoding
- b) prefix encoding**
- c) frequency encoding
- d) trie encoding

33. What is the running time of the Huffman encoding algorithm?

- a)  $O(C)$
- b)  $O(\log C)$
- c)  $O(C \log C)$**

d)  $O(N \log C)$

34. What is the running time of the Huffman algorithm, if its implementation of the priority queue is done using linked lists?

- a)  $O(C)$
- b)  $O(\log C)$
- c)  $O(C \log C)$
- d)  $O(C^2)$

35. 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

36. While recovering signal, which gets attenuated more?

- a) Low frequency component
- b) **High frequency component**
- c) Low & High frequency component
- d) None of the mentioned

37. Mutual information should be

- a) Positive
- b) Negative
- c) **Positive & Negative**
- d) None of the mentioned

38. ASCII code is a

- a) **Fixed length code**
- b) Variable length code
- c) Fixed & Variable length code
- d) None of the mentioned

39. Which reduces the size of the data?

- a) **Source coding**
- b) Channel coding
- c) Source & Channel coding
- d) None of the mentioned

40. In digital image coding which image must be smaller in size?

- a) Input image
- b) **Output image**
- c) Input & Output image
- d) None of the mentioned

41. Which coding method uses entropy coding?

- a) Lossless coding
- b) **Lossy coding**

- c) Lossless & Lossy coding
- d) None of the mentioned

42. Which achieves greater compression?

- a) Lossless coding
- b) Lossy coding**
- c) Lossless & Lossy coding
- d) None of the mentioned

43. A code is a mapping from

- a) Binary sequence to discrete set of symbols
- b) Discrete set of symbols to binary sequence**
- c) All of the mentioned
- d) None of the mentioned

44. Which are uniquely decodable codes?

- a) Fixed length codes**
- b) Variable length codes**
- c) Fixed & Variable length codes**
- d) None of the mentioned

45. A rate distortion function is a

- a) Concave function
- b) Convex function**
- c) Increasing function
- d) None of the mentioned

46. Self-information should be

- a) Positive**
- b) Negative**
- c) Positive & Negative**
- d) None of the mentioned

47. The unit of average mutual information is

- a) Bits**
- b) Bytes**
- c) Bits per symbol**
- d) Bytes per symbol**

48. When probability of error during transmission is 0.5, it indicates that

- a) Channel is very noisy
- b) No information is received
- c) Channel is very noisy & No information is received**
- d) None of the mentioned

49. Binary Huffman coding is a

- a) Prefix condition code**
- b) Suffix condition code**

- c) Prefix & Suffix condition code
- d) None of the mentioned

50. The event with minimum probability has least number of bits.

- a) True
- b) False**

51. The method of converting a word to stream of bits is called as

- a) Binary coding
- b) Source coding**
- c) Bit coding
- d) Cipher coding

52. When the base of the logarithm is 2, then the unit of measure of information is

- a) Bits**
- b) Bytes
- c) Nats
- d) None of the mentioned

53. When X and Y are statistically independent, then  $I(x,y)$  is

- a) 1
- b) **0**
- c)  $\ln 2$
- d) Cannot be determined

54. The self information of random variable is

- a) 0
- b) 1
- c) Infinite**
- d) Cannot be determined

55. Entropy of a random variable is

- a) 0
- b) 1
- c) Infinite**
- d) Cannot be determined

56. Which is more efficient method?

- a) Encoding each symbol of a block
- b) Encoding block of symbols**
- c) Encoding each symbol of a block & Encoding block of symbols
- d) None of the mentioned

57. Lempel-Ziv algorithm is

- a) Variable to fixed length algorithm**
- b) Fixed to variable length algorithm
- c) Fixed to fixed length algorithm
- d) Variable to variable length algorithm

58. Coded system are inherently capable of better transmission efficiency than the uncoded system.

- a) True
- b) False

59. The prefix code is also known as

- a. Instantaneous code
- b. Block code
- c. Convolutional code
- d. Parity bit

60. Down sampling is to make a digital image file smaller by

- a) adding pixels
- b) removing noise
- c) removing pixels
- d) adding noise

61. How many printable characters does the ASCII character set consists of? a) 120

- b) 128
- c) 100
- d) 98

62. Which bit is reserved as a parity bit in an ASCII set?

- a) first
- b) seventh
- c) eighth
- d) tenth

63. How many bits are needed for standard encoding if the size of the character set is X?

- a)  $\log X$
- b)  $X+1$
- c)  $2X$
- d)  $X^2$

64. The code length does not depend on the frequency of occurrence of characters.

- a) true
- b) false

65. In Huffman coding, data in a tree always occur?

- a) roots
- b) leaves
- c) left sub trees
- d) right sub trees

66. What are the types of quantization error?

- a. Granular error
- b. Slope over load error
- c. Both a & b**
- d. None of the above

67. What are the types of quantizer?

- a. Midrise quantizer
- b. Midtread quantizer
- c. Both a & b**
- d. None of the above

68. What are the types of adaptive quantization?

- a. forward adaptive quantization
- b. backward adaptive quantization
- c. Both a & b**
- d. None of the above

69. Which is a quantization process?

- a) Rounding
- b) Truncation
- c) Rounding & Truncation**
- d) None of the mentioned

70. Quantization is a \_\_\_\_\_ process.

- a) Few to few mapping
- b) Few to many mapping
- c) Many to few mapping**
- d) Many to many mapping

71. Quantization is a \_\_\_\_\_ process.

- a) Non linear**
- b) Reversible**
- c) Non linear & Reversible**
- d) None of the mentioned

72. Which conveys more information?

- a) High probability event
- b) Low probability event**
- c) High & Low probability event
- d) None of the mentioned

73. What is the type of quantizer, if a Zero is assigned a quantization level?

- a) Midrise type
- b) Mid tread type**
- c) Mistreat type
- d) None of the mentioned

74. What is the type of quantizer, if a Zero is assigned a decision level?

- a) **Midrise type**
- b) Mid tread type
- c) Mistreat type
- d) None of the mentioned

75. If the input analog signal is within the range of the quantizer, the quantization error  $e_q(n)$  is bounded in magnitude i.e.,  $|e_q(n)| < \Delta/2$  and the resulting error is called?

- a) **Granular noise**
- b) Overload noise
- c) Particulate noise
- d) Heavy noise

76. If the input analog signal falls outside the range of the quantizer(clipping),  $e_q(n)$  becomes unbounded and results in \_\_\_\_\_

- a) Granular noise
- b) **Overload noise**
- c) Particulate noise
- d) Heavy noise

77. In the mathematical model for the quantization error  $e_q(n)$ , to carry out the analysis, what are the assumptions made about the statistical properties of  $e_q(n)$ ?

- i. The error  $e_q(n)$  is uniformly distributed over the range —  $\Delta/2 < e_q(n) < \Delta/2$ .
  - ii. The error sequence is a stationary white noise sequence. In other words, the error  $e_q(m)$  and the error  $e_q(n)$  for  $m \neq n$  are uncorrelated.
  - iii. The error sequence  $\{e_q(n)\}$  is uncorrelated with the signal sequence  $x(n)$ .
  - iv. The signal sequence  $x(n)$  is zero mean and stationary.
- a) i, ii & iii
  - b) **i, ii, iii, iv**
  - c) i, iii
  - d) ii, iii, iv

78. What is the abbreviation of SQNR?

- a) Signal-to-Quantization Net Ratio
- b) **Signal-to-Quantization Noise Ratio**
- c) Signal-to-Quantization Noise Region
- d) Signal-to-Quantization Net Region

79. What is the scale used for the measurement of SQNR?

- a) DB
- b) db
- c) **dB**
- d) All of the mentioned

80. What is the expression for SQNR which can be expressed in a logarithmic scale?

- a)  **$10 \log_{10}(P_x/P_n)$**

- b)  $10 \log_{10}(P_n/P_s)$
- c)  $10 \log_2(P_s/P_n)$
- d)  $2 \log_2(P_s/P_n)$

81. In the equation  $SQNR = 10 \log_{10}(P_s/P_n)$ , what are the terms  $P_s$  and  $P_n$  are called \_\_\_\_\_ respectively.

- a) Power of the Quantization noise and Signal power
- b) Signal power and power of the quantization noise**
- c) None of the mentioned
- d) All of the mentioned

82. In the equation  $SQNR = 10 \log_{10}(P_s/P_n)$ , what are the expressions of  $P_s$  and  $P_n$ ?

- a)  $P_s = \sigma^2 = E[x^2(n)]$  and  $P_n = \sigma^2 = E[e^2 q(n)]$**
- b)  $P_s = \sigma^2 = E[x^2(n)]$  and  $P_n = \sigma^2 = E[e^3 q(n)]$
- c)  $P_s = \sigma^2 = E[x^3(n)]$  and  $P_n = \sigma^2 = E[e^2 q(n)]$
- d) None of the mentioned

83. If the quantization error is uniformly distributed in the range  $(-\Delta/2, \Delta/2)$ , the mean value of the error is zero then the variance  $P_n$  is?

- a)  $P_n = \sigma^2 = \frac{\Delta^2}{12}$**
- b)  $P_n = \sigma^2 = \frac{\Delta^2}{6}$
- c)  $P_n = \sigma^2 = \frac{\Delta^2}{4}$
- d)  $P_n = \sigma^2 = \frac{\Delta^2}{2}$

84. By combining  $\Delta = R/2b + 1$  with  $P_n = \sigma^2 = \Delta^2/12$  and substituting the result into  $SQNR = 10 \log_{10}(P_s/P_n)$ , what is the final expression for  $SQNR = ?$

- a)  $6.02b + 16.81 + 20 \log_{10}(R/\sigma_x)$
- b)  $6.02b + 16.81 - 20 \log_{10}(R/\sigma_x)$**
- c)  $6.02b - 16.81 - 20 \log_{10}(R/\sigma_x)$
- d)  $6.02b - 16.81 - 20 \log_{10}(R/\sigma_x)$

85. In the equation  $SQNR = 6.02b + 16.81 - 20 \log_{10}(R/\sigma_x)$ , for  $R = 6\sigma_x$  the equation becomes?

- a)  $SQNR = 6.02b - 1.25$  dB
- b)  $SQNR = 6.87b - 1.55$  dB
- c)  $SQNR = 6.02b + 1.25$  dB**
- d)  $SQNR = 6.87b + 1.25$  dB

86. What characterizes a quantizer?

- a. The output of a quantizer has the same entropy rate as the input.
- b. Quantization results in a non-reversible loss of information.**
- c. A quantizer always produces uncorrelated output samples.

87. What property has the output signal of a scalar quantizer?

- a. The output is a discrete signal with a countable symbol alphabet (but not necessarily a finite symbol alphabet).**

- b. The output is a discrete signal with a finite symbol alphabet.
- c. The output signal may be discrete or continuous.

88. What is a Lloyd quantizer?

- a. **A Lloyd quantizer is the scalar quantizer that yields the minimum distortion for a given source and a given number of quantization intervals.**
- b. The output of a Lloyd quantizer is a discrete signal with a uniform pmf.
- c. For a given source, the Lloyd quantizer is the best possible scalar quantizer in ratedistortion sense. That means, there does not exist any other scalar quantizer that yields a smaller distortion at the same rate.

89. A Lloyd quantizer can be considered as optimal quantizer for fixed-length coding of the quantization indices. Can we improve a Lloyd quantizer by using variable length codes?

- a. No, variable length coding does not improve the quantizer performance, since all quantization indices have the same probability.
- b. No, variable length coding does not improve the quantizer performance, since the quantizer output is uncorrelated.
- c. **Yes, in general, the quantizer performance can be improved by variable length coding (there are some exceptions for special sources).**

90. What characterizes an entropy-constrained Lloyd quantizer?

- a. **An entropy-constrained Lloyd quantizer is the scalar quantizer that yields the best ratedistortion performance for a given operation point (assuming that the quantization indices are coded using optimal entropy coding).**
- b. An entropy-constrained Lloyd quantizer minimizes the entropy rate of the quantizer output for a given number of quantization intervals.
- c. An entropy-constrained Lloyd quantizer minimizes the number of quantization intervals for a given distortion.

91. What characterizes the best possible scalar quantizer with variable length coding at high rates (for MSE distortion)?

- a. All quantization intervals have the same probability.
- b. **All quantization intervals have the same size.**
- c. None of the above statements is correct.

92. Which statement is true regarding the performance of optimal scalar quantizers with variable length coding at high rates for iid sources?

- a. For iid sources, the operational distortion-rate curve for optimal scalar quantization is always equal to the distortion-rate function (theoretical limit).
- b. Only for Gaussian iid sources, the operational distortion-rate curve for optimal scalar quantization is equal to the distortion-rate function (theoretical limit)
- c. **For iid sources, the operational distortion-rate curve for optimal scalar quantization is 1.53 dB worse than the distortion-rate function (theoretical limit).**

93. What characterizes a vector quantizer?

- a. **Multiple input symbols are represented by one quantization index.**

- b. Multiple quantization indexes are represented by one codeword.
  - c. Each input symbol is represented by a fixed-length codeword.
94. What statement is correct for comparing scalar quantization and vector quantization?
- a. **By vector quantization we can always improve the rate-distortion performance relative to the best scalar quantizer.**
  - b. Vector quantization improves the performance only for sources with memory. For iid sources, the best scalar quantizer has the same efficiency as the best vector quantizer.
  - c. Vector quantization does not improve the rate-distortion performance relative to scalar quantization, but it has a lower complexity.
95. Why is vector quantization rarely used in practical applications?
- a. The coding efficiency is the same as for scalar quantization.
  - b. It requires block Huffman coding of quantization indexes, which is very complex.
  - c. **The computational complexity, in particular for the encoding, is much higher than in scalar quantization and a large codebook needs to be stored.**
96. Assume we have a source with memory and apply scalar quantization and scalar Huffman coding? Can the performance, in general, be improved by replacing the scalar Huffman coding by conditional Huffman coding or block Huffman coding?
- a. **Yes, the performance can in general be improved, since there will be also dependencies between successive quantization indexes.**
  - b. No, the performance cannot be improved, since the quantization removes all dependencies between the source symbols.
  - c. No, the performance cannot be improved, since the quantization error and the input signal are uncorrelated.
97. Uniform quantizer is also known as
- a) Low rise type
  - b) **Mid rise type**
  - c) High rise type
  - d) None of the mentioned
98. The SNR value can be increased by \_\_\_\_\_ the number of levels.
- a) **Increasing**
  - b) Decreasing
  - c) Does not depend on
  - d) None of the mentioned
99. Prediction gain \_\_\_\_\_ for better prediction.
- a) **Increases**
  - b) Decreases
  - c) Remains same
  - d) None of the mentioned
100. Delta modulation is
- a) **1 bit DPCM**

- b) 2 bit DPCM
- c) 4 bit DPCM
- d) None of the mentioned

101. 1 bit quantizer is a

- a) Hard limiter
- b) Two level comparator
- c) **Hard limiter & Two level comparator**
- d) None of the mentioned

102. If step size is increased \_\_\_\_\_ occurs.

- a) Slope overload distortion
- b) **Granular noise**
- c) Slope overload distortion & Granular noise
- d) None of the mentioned

103. Which helps in maintaining the step size?

- a) Delta modulation
- b) PCM
- c) DPCM
- d) **Adaptive delta modulation**

104. The low pass filter at the output end of delta modulator depends on

- a) Step size
- b) Quantization noise
- c) **Bandwidth**
- d) None of the mentioned

105. In early late timing error detection method if the bit is constant, then the slope will be

- a) **Close to zero**
- b) Close to infinity
- c) Close to origin
- d) None of the mentioned

106. The theoretical gain in zero crossing TED is greater than early late TED.

- a) **True**
- b) False

107. Non uniform quantizer \_\_\_\_\_ distortion.

- a) Increases
- b) **Decreases**
- c) Does not effect
- d) None of the mentioned

108. Vector quantization is used in

- a) Audio coding
- b) Video coding

c) **Speech coding**

d) All of the mentioned

109. The spectral density of white noise is

a) Exponential

**b) Uniform**

c) Poisson

d) Gaussian

110. The probability density function of the envelope of narrow band noise is

a) Uniform

**b) Gaussian**

c) Rayleigh

d) Rician

111. The type of noise that interferes much with high frequency transmission is

a) White

b) Flicker

**c) Transit time**

d) Shot

112. Thermal noise power of a resistor depends upon

a) Its resistance value

**b) Noise temperature**

c) Bandwidth

d) Ambient temperature

113. The size of the quantile interval is called as

a) Inter level

**b) Step size**

c) Quantile size

d) Level width

114. Uniform quantization provides better quantization for

a) Weak signals

**b) Strong signals**

c) Weak & Strong signals

d) None of the mentioned

115. Non uniform quantization provides better quantization for

**a) Weak signals**

**b) Coarse signals**

c) Weak & Coarse signals

d) None of the mentioned

116. In non uniform quantization, the quantization noise is \_\_\_\_\_ to signal size.

- a) Inversely proportional
- b) Directly proportional**
- c) Equal
- d) Double

117. The output SNR can be made independent of input signal level by using

- a) Uniform quantizer
- b) Non uniform quantizer**
- c) Uniform & Non uniform quantizer
- d) None of the mentioned

118. Companding is the process of

- a) Compression
- b) Expansion
- c) Compression & Expansion**
- d) None of the mentioned

119. Which value of  $\mu$  corresponds to linear amplification?

- a)  $\mu=0$**
- b)  $\mu=1$
- c)  $\mu>0$
- d)  $\mu<0$

120. What is the standard value of  $\mu$  in  $\mu$ -law ? a) 128

- b) 255**
- c) 256
- d) 0

121. The standard value of A in A-law is

- a) 87
- b) 88
- c) 86.7
- d) 87.6**

122. Which type of quantization is most preferable for audio signals for a human ear?

- a) Uniform quantization
- b) Non uniform quantization**
- c) Uniform & Non uniform quantization
- d) None of the mentioned

123. The characteristics of compressor in  $\mu$ -law companding are

- a) Continuous in nature**
- b) Logarithmic in nature
- c) Linear in nature
- d) Discrete in nature

124. In Linde–Buzo–Gray algorithm, at each iteration, each vector is split into

- a. two new vectors
- b. three new vectors
- c. four new vectors
- d. eight new vectors

125. JBIG stands for

- a. **Joint Bi-level Image Experts Group**
- b. Joint Bi-level Image Export Group
- c. Joint Binary Image Experts Group
- d. None of the above

126. The main features of JBIG is/are:

- a. Lossless compression of one-bit-per-pixel image data
- b. Ability to encode individual bitplanes of multiple-bit pixels
- c. Progressive or sequential encoding of image data
- d. **All the above**

127. Which among the following compression techniques is/are intended for still images?

- a. **JPEG**
- b. H.263
- c. **MPEG**
- d. All of the above

128. Lempel–Ziv–Welch (LZW) Algorithm is used for

- a. **lossless compression**
- b. lossy compression

129. Lempel–Ziv–Welch (LZW) Algorithm is used to compress

- a. GIF
- b. PDF
- c. TIFF
- d. **All the above**

130. GIF stands for

- a. Graphical Interface Format
- b. **Graphical Interchange Format**
- c. Graphical Intrachange Format
- d. Graphical Interlinked Fomat

131. GIF uses \_\_\_\_\_ dictionary for compressing data.

- a. StaticAdaptive/Dynamic
- b. Both a & b
- c. None of the above

132. JBIG2 compression is

- a. lossless compression
- b. **lossy compression**

133. LZ77 and LZ78 are the two \_\_\_\_\_ data compression algorithms.

- a. **lossless**
- b. lossy

134. The LZ77 algorithm works on \_\_\_\_\_ data whereas LZ78 algorithm attempts to work on \_\_\_\_\_ data.

- a. future , past
- b. past , future**
- c. present, future
- d. past, present

135. Prediction by Partial Matching is a method to predict the next symbol depending on n previous. This method is else called prediction by \_\_\_\_\_ Model.

- a. Probability
- b. Physical
- c. Markov**
- d. None of the above

136. The Burrows–Wheeler transform (BWT, also called block-sorting compression) is used to compress

- a. float numbers
- b. strings**
- c. real numbers
- d. All the above

**AKTU EXAM 19-20**  
**Data Compression Solved MCQ**  
**Answer Key**

Question	Answer	Question	Answer	Question	Answer
1	B	26	A	51	B
2	C	27	A	52	D
3	A	28	D	53	C
4	B	29	A	54	B
5	B	30	C	55	A
6	A	31	C	56	B
7	A	32	A	57	A
8	D	33	A	58	D
9	D	34	B	59	C
10	C	35	D	60	B
11	B	36	A	61	C
12	B	37	D	62	C
13	C	38	A	63	D
14	B	39	A	64	A
15	D	40	D	65	D
16	A	41	C	66	B
17	C	42	D	67	C
18	B	43	D	68	B
19	A	44	C	69	A OR D
20	C	45	B	70	B
21	D	46	A		
22	B	47	C		
23	B	48	D		
24	B	49	C		
25	A	50	A		

Note: Attempt all questions. The question paper contains 70 MCQ type questions. Each question carries equal marks. Select the answer and fill the bubble corresponding to that question in the attached OMR sheet.

1. Data compression is a \_\_\_\_\_ in the number of bits needed to represent data.  
(A) increment  
 (B) reduction  
(C) expansion  
(D) none of the above
2. Data compression schemes can be divided into \_\_\_\_\_ broad classes.  
(A) 4  
(B) 3  
 (C) 2  
(D) 5
3. Text compression is an example of \_\_\_\_\_ compression.  
(A) lossless compression  
(B) lossy compression  
(C) both (A) and (B)  
(D) none of the above
4. Video compression is an example of \_\_\_\_\_ compression  
 (A) lossless compression  
 (B) lossy compression  
(C) both (A) and (B)  
(D) None of the above
5. The ratio of the number of bits required to represent data before compression to the number of bits required to represent the data after compression is known as:  
\_\_\_\_\_
- (A) aspect Ratio  
 (B) compression ratio  
(C) bit ratio  
(D) none of the above
6. A description of the model and a description of how the data differ from the model are encoded is called  
 (A) modelling  
(B) testing  
(C) coding  
(D) maintenance
7. The average number of bits required to represent single sample is known as:  
\_\_\_\_\_  
(A) bit rate  
(B) byte rate  
(C) compression rate  
(D) all of the above
8. The difference between the original and reconstruction is often called  
\_\_\_\_\_  
(A) waveform  
(B) distortion  
(C) noise  
(D) error
9. The compression of analog signals is referred to as  
\_\_\_\_\_  
(A) analog coding  
(B) arithmetic coding  
(C) huffman coding  
 (D) waveform coding

10. The difference between the data and the model is called as  
(A) residual  
(B) waveform  
(C) **distortion**  
(D) none of the above
11. The first order entropy of the following sequence is  
1 2 3 2 3 4 5 4 5 6 7 8 9 8 9 10  
(A) 2.25 bits/symbol  
(B) **3.25 bits/symbol**  
(C) 1.25 bits/symbol  
(D) 5.25 bits/symbol
12. The probability models also known with another name \_\_\_\_\_.  
(A) knowledge Model  
**(B)** reconstructed Model  
(C) **ignorance Model**  
(D) none of the above
13. ASCII code uses the same number of bits to represent each symbol such code is called  
(A) variable length code  
(B) fixedxped code  
**(C)** **fixed length code**  
(D) none of the above
14. Test the following codes are uniquely decodable or not:  
 $\{0,01,11\}$   
(A) uniquely decodable codes  
**(B)** **not uniquely decodable**  
(C) neither uniquely decodable nor not uniquely decodable  
(D) none of the following
15. A code in which no codeword is a prefix to another codeword is called a  
(A) uniquely decodable code  
(B) huffman code  
(C) arithmetic code  
**(D)** **prefix code**
16. The difference between the entropy and the average length is called  
**(A)** **self information**  
(B) redundancy  
(C) probability  
(D) none of the above
17. In Huffman tree NYT stands for \_\_\_\_\_  
(A) No Yet Transmitted  
(B) Not Yet Transmission  
**(C)** **Not Yet Transmitted**  
(D) None of the above
18. In Golomb code the unary code for a positive integer n is simply  
(A) n 0s followed by 1  
(B) **n 1s followed by 0**  
(C) n 1s followed by 00  
**(D)** n 0s followed by 11
19. In Golomb code the unary code of 5 is  
(A) **111110**  
(B) 000001  
(C) 1111100  
(D) 0000011
20. In Rice codes the CCSDS stands for  
(A) Consultative Committee on Standard Data Science

- (B) Consultative Commission on Standard Data Science
- (C) Consultative Committee on Space Data Standards
- (D) Consultative Committee on Specialized Data Science
21. In CCSDS algorithm the \_\_\_\_\_ removes correlation from the input and generates a sequence of nonnegative integers.
- (A) a binary coder
- (B) a binary generator
- (C) a parity checker
- (D) a pre-processor
22. The binary coder generates a \_\_\_\_\_ to represent the integer sequence.
- (A) byte stream
- (B) bit Stream
- (C) character stream
- (D) none of the above
23. In which codes all codewords have equal length?
- (A) Huffman codes
- (B) Golomb codes
- (C) Prefix Codes
- (D) Tunstall codes
24. In  $n$ -bit Tunstall code for a source the number of codewords is:
- (A)  $\log n$
- (B)  $2n$
- (C)  $2n-1$
- (D)  $2n+1$
25. The image consists of 256 rows of 256 pixels, so the uncompressed representation uses \_\_\_\_\_ bytes.
- (A) 65536
- (B) 65426
- (C) 66536
- (D) 66325
26. At what rate the audio signal for each stereo channel is sampled?
- (A) 42.2 kHz
- (B) 43.1 kHz
- (C) 44.1 kHz
- (D) 44.2 kHz
27. In Rice codes the ROS is used when the last five or more blocks in a segment are all \_\_\_\_\_.
- (A) one
- (B) zero
- (C) same
- (D) none of the above
28. What is the value of redundancy in Huffman codes when the probabilities are negative powers of two?
- (A) 1
- (B) 2
- (C) 3
- (D) 0
29. Who was the developer of Rice codes?
- (A) Robert F. Rice
- (B) Robin S. Rice
- (C) Robert S. Rice
- (D) None of the above

- 37, 3, 2, 4
30. Which is the most popular method for generating variable length codes?
- Huffman Coding
  - arithmetic Coding
  - run Length coding
  - none of the above
31. Which one of the following is not application of arithmetic coding?
- bi-level image compression
  - JBIG
  - JBIG-2
  - text compression
32. A static dictionary technique that is less specific to a single application is \_\_\_\_\_.
- digram coding
  - arithmetic coding
  - huffman coding
  - all of the above
33. In LZ77 a buffer that contains portion of the recently encoded sequence is called
- look ahead buffer
  - search buffer
  - stack buffer
  - none of the above
34. In LZ77 a buffer that contains next portion of the sequence to be encoded is called a
- stack buffer
  - look ahead buffer
  - search buffer
  - all of the above
35. Which one of the following is an application of LZW compression algorithm?
- Audio compression
  - Video compression
  - Text compression
  - Unix compress
36. GIF stands for
- Graphics Interchange Format
  - Graphical Image Format
  - Graphics Image Format
  - None of the above
37. Which coding scheme use the history of the sequence to determine its encoding?
- Huffman coding
  - Arithmetic coding
  - Prefix coding
  - None of the above
38. Which one is the best known context based algorithm?
- Prediction with Partial Match
  - LZ77
  - LZ78
  - LZW
39. CALIC stands for
- Context Adaptive Lossless Image Compression
  - Content Adaptive Lossy Image compression
  - Context Adaptive Lossy Image compression
  - none of the above

40. Which coding scheme that takes advantages of long runs of identical symbols?
- (A) arithmetic coding  
(B) move to front coding  
(C) move to back coding  
(D) **predictive coding**
41. In which transmission a page is scanned and converted into a sequence of black or white pixels?
- (A) audio transmission  
(B) video transmission  
**(C) facsimile transmission**  
(D) all of the above
42. Which algorithm requires that the entire sequence to be coded be available to the encoder before the coding takes place?
- (A) LZW  
(B) LZ8  
(C) The Burrows-Wheeler Transform  
(D) **None of the above**
43. Which model gives rise the run length coding?
- (A) Physical model  
(B) Probability model  
(C) Composite source model  
**(D) Capon model**
44. Which type of model generate representations of an image with varying spatial resolution?
- (A) physical model  
(B) probability model
45. Which compression takes the advantage of relationships and correlations that extend beyond a single symbol?
- (A) Image compression  
**(B) Dynamic Markov Compression**  
(C) Audio compression  
(D) All of the above
46. Name of the two popular measures of distortion are
- (A) squared error and absolute difference  
(B) fidelity and quality  
**(C) scalar quantization and vector quantization**  
(D) mean squared error and signal to noise ratio
47. Rate is defined as the \_\_\_\_\_ number of bits used to represent each sample value.
- (A) Maximum  
(B) Minimum  
**(C) Average**  
(D) all of the above
48. The rate distortion function  $R(D)$  specifies the \_\_\_\_\_ rate at which the output of a source can be encoded while keeping the distortion less than or equal to  $D$ .
- (A) highest**  
(B) lowest

- (C) smallest  
(D) average
49. The models play an important role in the \_\_\_\_\_ of lossy compression algorithms.  
(A) testing  
(B) maintenance  
(C) design  
(D) coding
50. Which model is used to for the design and analysis of lossy compression schemes?  
(A) probability model  
(B) linear System Model  
(C) physical model  
(D) none of the above
51. The models are based on the physics of the source output production are called \_\_\_\_\_.  
(A) probability models  
(B) physical models  
(C) composite source models  
(D) none of the above
52. The process of representing a large possibly infinite set of values with a much smaller set is called \_\_\_\_\_.  
(A) uniform quantization  
(B) scalar quantization  
(C) non uniform quantization  
(D) quantization
53. A mapping which divides the range of values that the source generates into number of intervals is called  
(A) decoder mapping
- (B) encoder mapping  
(C) both (A) and (B)  
(D) none of the above
54. A mapping that generates a reconstruction value is called \_\_\_\_\_.  
(A) encoder mapping  
(B) decoder mapping  
(C) multiplexer mapping  
(D) demultiplexer mapping
55. A quantizer that does not have zero as one of its representation levels is called  
(A) midrise quantizer  
(B) midtread quantizer  
(C) scalar quantizer  
(D) vector quantizer
56. Control Systems and audio coding schemes are the examples of \_\_\_\_\_ quantizer.  
(A) midrise quantizer  
(B) midtread quantizer  
(C) nonuniform quantizer  
(D) none of the above
57. In which quantization approach there is a need for side information?  
(A) forward adaptive  
(B) backward adaptive  
(C) uniform  
(D) scalar
58. In \_\_\_\_\_ quantization the quantizer output is available to both transmitter and receiver, there is no need for side information.

- (A) scalar  
(B) vector  
(C) forward adaptive  
(D) backward adaptive
59. A quantizer also known with another name " quantization with one word memory" is called  
(A) midrise quantizer  
(B) midtread quantizer  
(C) Jayant quantizer  
(D) vector quantizer
60. A nonuniform quantizer provides \_\_\_\_\_ average distortion.  
(A) lowest  
(B) lower  
(C) average  
(D) higher
61. For a given Lloyd -Max quantizer, the quantizer output and the quantization noise are \_\_\_\_\_.  
(A) diagonal  
(B) square  
(C) orthogonal  
(D) parallel
62. In compounded quantization, the compressor function \_\_\_\_\_ the high-probability regions close to the origin.  
(A) compresses  
(B) expands  
(C) stretches  
(D) all of the above
63. In vector quantization, a set of L-dimensional vectors called \_\_\_\_\_ of the vector quantizer.  
(A) code vectors  
(B) directory  
(C) vectors  
(D) codebook
64. Each code vector is assigned a \_\_\_\_\_ index.  
(A) binary  
(B) decimal  
(C) octal  
(D) none of the above
65. The vectors in the codebook is known as  
(A) block vectors  
(B) quantized vectors  
(C) sampled vectors  
(D) code-vectors
66. In vector quantization at the \_\_\_\_\_, the input vector is compared to each code vector in order to find code vector closest to the input vector.  
(A) Decoder  
(B) Encoder  
(C) Multiplexer  
(D) None of the above
67. The elements of the code-vector are the \_\_\_\_\_ values of the source output.  
(A) sampled  
(B) binary  
(C) quantized  
(D) none of the above

68. The LBZ stands for
- (A) Linde-Buze-Gray
  - (B) **Linde-Buzo-Grey**
  - (C) Linde-Buzo-Green
  - (D) **None of the above**
69. In tree structured codebook the removal of subgroups is called
- (A) **pruning**
  - (B) parsing
  - (C) updation
  - (D) none of the above
70. The regular arrangements of output points in space are called
- (A) cell
  - (B) **lattices**
  - (C) pyramid
  - (D) none of the above

\*\*\*\*\*