RCS 087: DATA COMPRESSION

MCQ Questions

Unit I Compression Techniques: Loss less compression, Lossy Compression, Measures of performance, Modeling and coding, Mathematical Preliminaries for Lossless compression: A brief introduction to information theory, Models: Physical models, Probability models, Markov models, composite source model, Coding: uniquely decodable codes, Prefix codes.

Unit II The Huffman coding algorithm: Minimum variance Huffman codes, Adaptive Huffman coding: Update procedure, Encoding procedure, Decoding procedure. Golomb codes, Rice codes, Tunstall codes, Applications of Hoffman coding: Loss less image compression, Text compression, Audio Compression.

Unit III Coding a sequence, Generating a binary code, Comparison of Binary and Huffman coding, Applications: Bi-level image compression-The JBIG standard, JBIG2, Image compression. Dictionary Techniques: Introduction, Static Dictionary: Diagram Coding, Adaptive Dictionary. The LZ77 Approach, The LZ78 Approach, Applications: File Compression-UNIX compress, Image Compression: The Graphics Interchange Format (GIF), Compression over Modems: V.42 bits, Predictive Coding: Prediction with Partial match (ppm): The basic algorithm, The ESCAPE SYMBOL, length of context, The Exclusion Principle, The Burrows-Wheeler Transform: Movetofront coding, CALIC, JPEG-LS, Multi-resolution Approaches, Facsimile Encoding, Dynamic Markoy Compression.

Unit IV Distortion criteria, Models, Scalar Ouantization: The Quantization problem, Uniform Quantizer, Adaptive Quantization, Non uniform Quantization.

Unit V Advantages of Vector Quantization over Scalar Quantization, The Linde-Buzo-Gray Algorithm, Tree structured Vector Quantizers. Structured VectorQuantizers.

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) .gzp
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. Digital video is sequence of
A. pixels
B. matrix
C. frames
D. coordinates

32. Image compression comprised of
A. encoder
B. decoder
C. frames
D. Both A and B

33. Information is the
A. data
B. meaningful data
C. raw data
D. Both A and B

34. Coding redundancy works on
A. pixels
B. matrix
C. intensity
D. coordinates

35. Sequence of code assigned is called
A. code word
B. word
C. byte
D. nibble

36. Every run length pair introduce new
A. pixels
B. matrix
C. frames
D. intensity

37. If the pixels are reconstructed without error mapping is said to be
A. reversible
B. irreversible
C. temporal
D. facsimile

38. If the P(E) = 1, it means event
A. does not occur
B. always occur
C. no probability
D. normalization

39. In the coding redundancy technique we use
A. fixed length code
B. variable length code
C. byte
D. Both A and B

40. Morphology refers to
A. pixels
B. matrix
C. frames
D. shape

41. FAX is an abbreviation of
A. fast
B. female
C. feminine
D. facsimile

42. Source of information depending on finite no of outputs is called
A. markov
B. finite memory source
C. zero source
D. Both A and B

43. Types of data redundancy are
A. 1
B. 2
C. 3
D. 4

44. Information per source is called
A. sampling
B. quantization
C. entropy
D. normalization

45. Image with very high quality is considered as
A. good
B. fair
C. bad
D. excellent

46. Range [0, L-1], where L is the
A. no of levels
B. length
C. no of intensity levels
D. low quality

47. Compression is done for saving
A. storage
B. bandwidth
C. money
D. Both A and B

48. System of symbols to represent event is called
A. storage
B. word
C. code
D. nibble

49. In the image MxN, M is
A. rows
B. column
C. level
D. intensity

50. In the image MxN, N is
A. rows
B. column
C. level
D. intensity

51. HD television are
A. low definition
B. high definition
C. enhanced
D. low quality

52. Inferior image is the image having
A. low definition
B. high definition
C. intensity
D. coordinates

53. Image with very poor quality is considered as
A. good
B. fair
C. bad
D. excellent

54. Digitizing the coordinates of the image is called
A. sampling
B. quantization
C. framing
D. Both A and B

55. Source of the event itself called
A. zero-memory source
B. nonzero-memory source
C. zero source
D. memory source

56. If the pixels cannot be reconstructed without error mapping is said to be
A. reversible
B. irreversible
C. temporal
D. facsimile

57. Decoder is used for
A. image enhancement
B. image compression
C. image decompression
D. image equalization

58. Replication of the pixels is called
A. coding redundancy
B. spatial redundancy
C. temporal redundancy
D. both b and c

59. Information ignored the human eye is the
A. coding redundancy
B. spatial redundancy
C. temporal redundancy
D. irrelevant info

60. Normally internet delivers data at the rate of
A. 56kbps
B. 64kbps
C. 72kbps
D. 24kbps

61. Information lost when expressed mathematically is called
A. markov
B. finite memory source
C. fidelity criteria
D. noiseless theorem

62. Error of the image is referred to as
A. pixels
B. matrix
C. frames
D. noise

63. Formula pr = n/MN represents the
A. coding redundancy
B. spatial redundancy
C. temporal redundancy
D. irrelevant info

64. In the formula 1-(1/c), C is the
A. complex ratio
B. compression ratio
C. constant
D. condition

65. Irrelevant data is said to be
A. redundant data
B. meaningful data
C. raw data
D. Both A and B

66. Standard rate of showing frames in a video per second are
A. 10
B. 20
C. 25
D. 30

67. Reducing the data required referred to
A. image enhancement
B. image compression
C. image contrast
D. image equalization

68. One that is not a type of data redundancy is
A. coding
B. spatial
C. temporal
D. facsimile

69. Redundancy of the data can be found using formula
A. 1-(1/c)
B. 1+(1/c)
C. 1-(-1/c)
D. (1/c)

70. Transforming the difference between adjacent pixels is called
A. mapping
B. image compression
C. image watermarking
D. image equalization

71. Shannons theorem is also called
A. noiseless coding theorem
B. noisy coding theorem
C. coding theorem
D. noiseless theorem

72. A codec is capable of
A. encoding
B. decoding
C. framing
D. Both A and B

73. Encoder is used for
A. image enhancement
B. image compression
C. image decompression
D. image equalization

74. 1024 x 1024 image has resolution of
A. 1048576
B. 1148576
C. 1248576
D. 1348576

75. Digital images are displayed as a discrete set if
A. values
B. numbers
C. frequencies
D. intensities

76. In MxN, M is no of
A. intensity levels
B. colors
C. rows
D. columns

77. Each element of the matrix is called
A. dots
B. coordinate
C. pixels
D. value

78. Imaging system produces
A. high resolution image
B. voltage signal
C. digitized image
D. analog signal

79. Digitizing the coordinate values is called
A. radiance
B. illuminance
C. sampling
D. quantization

80. The smallest element of an image is called
A. pixel
B. dot
C. coordinate
D. digits

81. No of bits to store image is denoted by the formula
A. b = NxK
B. b = MxN
C. b = MxNxK
D. b = MxK

82. Black and white images have only
A. 2 levels
B. 3 levels
C. 4 levels
D. 5 levels

83. 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

84. 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

85. 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)

86. 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) $O(C^2)$

87. 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

88. 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

89. Mutual information should be
a) Positive
b) Negative
c) Positive & Negative
d) None of the mentioned

90. ASCII code is a
a) Fixed length code
b) Variable length code
c) Fixed & Variable length code
d) None of the mentioned

91. Which reduces the size of the data?
a) Source coding
b) Channel coding
c) Source & Channel coding
d) None of the mentioned

92. 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

93. Which coding method uses entropy coding?
a) Lossless coding
b) Lossy coding
c) Lossless & Lossy coding
d) None of the mentioned

94. Which achieves greater compression?
a) Lossless coding
b) Lossy coding
c) Lossless & Lossy coding
d) None of the mentioned

95. A code is a mapping from
a) Binary sequence to dicrete set of symbols
b) Discrete set of symbols to binary sequence
c) All of the mentioned
d) None of the mentioned

96. Which are uniquely decodable codes?
a) Fixed length codes
b) Variable length codes
c) Fixed & Variable length codes
d) None of the mentioned

97. A rate distortion function is a
a) Concave function
b) Convex function
c) Increasing function
d) None of the mentioned

98. Self-information should be
a) Positive
b) Negative
c) Positive & Negative
d) None of the mentioned

99. The unit of average mutual information is
a) Bits
b) Bytes
c) Bits per symbol
d) Bytes per symbol

100. 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

101. Binary Huffman coding is a
a) Prefix condition code
b) Suffix condition code
c) Prefix & Suffix condition code
d) None of the mentioned

102. The event with minimum probability has least number of bits.
a) True
b) False

103. 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

104. 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

105. When X and Y are statistically independent, then I (x,y) is
a) 1
b) 0
c) Ln 2
d) Cannot be determined

106. The self information of random variable is
a) 0
b) 1
c) Infinite
d) Cannot be determined

107. Entropy of a random variable is
a) 0

b) 1
c) Infinite
d) Cannot be determined

108. 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

109. 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

110. Coded system are inherently capable of better transmission efficiency than the uncoded system.
a) True
b) False

111. The prefix code is also known as
a. Instantaneous code
b. Block code
c. Convolutional code
d. Parity bit

112. Down sampling is to make a digital image file smaller by
a) adding pixels
b) removing noise
c) removing pixels
d) adding noise

113. How many printable characters does the ASCII character set consists of?
a) 120
b) 128
c) 100
d) 98

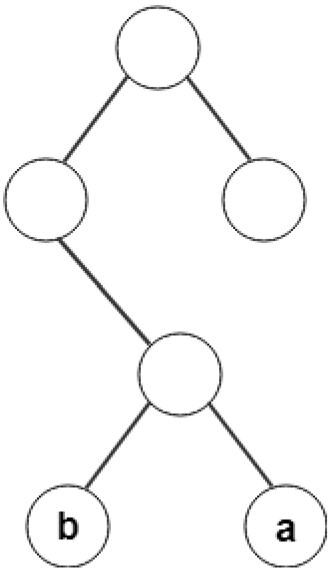
114. Which bit is reserved as a parity bit in an ASCII set?
a) first
b) seventh

c) eighth
d) tenth

115. 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

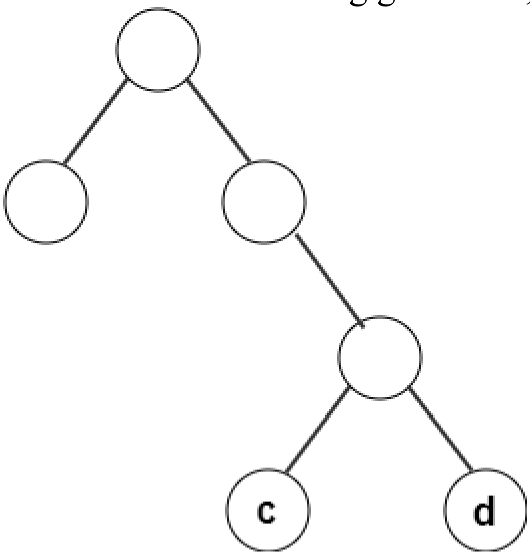
116. The code length does not depend on the frequency of occurrence of characters.
a) true
b) false

117. In Huffman coding, data in a tree always occur?
a) roots
b) leaves
c) left sub trees
d) right sub trees

118. From the following given tree, what is the code word for the character ‘a’?


a) 011
b) 010
c) 100
d) 101

119. From the following given tree, what is the computed codeword for 'c'?



a) 111
b) 101
c) 110
d) 011

120. What will be the cost of the code if character c_i is at depth d_i and occurs at frequency f_i?
a) $c_i f_i$
b) $\int c_i f_i$
c) $\sum f_i d_i$
d) $f_i d_i$

121. An optimal code will always be present in a full tree.
a) true
b) false

122. 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

123. 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)

124. The capacity of Gaussian channel is
a. C = 2B(1+S/N) bits/s
b. C = B2(1+S/N) bits/s
c. C = B(1+S/N) bits/s
d. C = B(1+S/N)2 bits/s

125. For M equally likely messages, the average amount of information H is
a. H = $\log_{10}M$
b. H = $\log_2 M$
c. H = $\log_{10}M2$
d. H = $2\log_{10}M$

126. The channel capacity is
a. The maximum information transmitted by one symbol over the channel
b. Information contained in a signal
c. The amplitude of the modulated signal
d. All of the above

127. The capacity of a binary symmetric channel, given H(P) is binary entropy function is
a. 1 - H(P)
b. H(P) - 1
c. 1 - H(P)2
d. H(P)2 – 1

128. According to Shannon Hartley theorem,
a. The channel capacity becomes infinite with infinite bandwidth
b. The channel capacity does not become infinite with infinite bandwidth
c. Has a tradeoff between bandwidth and Signal to noise ratio
d. Both b and c are correct

129. The negative statement for Shannon's theorem states that
a. If R > C, the error probability increases towards Unity
b. If R < C, the error probability is very small
c. Both a & b
d. None of the above

130. For M equally likely messages, M>>1, if the rate of information R ≤ C, the probability of error is
a. Arbitrarily small
b. Close to unity
c. Not predictable
d. Unknown

131. For M equally likely messages, M>>1, if the rate of information R > C, the probability of error is
a. Arbitrarily small
b. Close to unity
c. Not predictable
d. Unknown

132. 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

133. 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 $(1-P)^2$

134. 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

135. 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

136. 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

137. 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

138. The mutual information
a. Is symmetric
b. Always non negative
c. Both a and b are correct
d. None of the above

139. 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)

140. Entropy is
a. Average information per message
b. Information in a signal
c. Amplitude of signal
d. All of the above

141. 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

142. The information I contained in a message with probability of occurrence is given by (k is constant)
a. $I = k \log_2 1/P$
b. $I = k \log_2 P$
c. $I = k \log_2 1/2P$
d. $I = k \log_2 1/P_2$

143. The expected information contained in a message is called
a. Entropy
b. Efficiency
c. Coded signal
d. None of the above

144. A physical model is an example of
a. An iconic model
b. An analogue model
c. A verbal model
d. A mathematical model

145. In a matrix of transition probability, the element aij where i=j is a
a. Gain
b. Loss
c. Retention
d. None of the above

146. In Markov analysis, state probabilities must
a. Sum to one
b. Be less than one
c. Be greater than one
d. None of the above

147. If a matrix of transition probability is of the order n*n, then the number of equilibrium equations would be
a. n
b. n-1
c. n-2
d. None of the above

148. In the long run, the state probabilities become 0 & 1
a. In no case
b. In some cases
c. In all cases
d. None of the above

149. State transition probabilities in the Markov chain should
a. Sum to 1
b. Be less than 1
c. Be greater than 1
d. None of the above

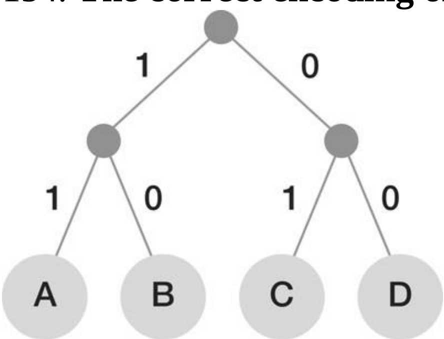
150. Which of the following is true about Huffman Coding?
(A) Huffman coding may become lossy in some cases
(B) Huffman Codes may not be optimal lossless codes in some cases
(C) In Huffman coding, no code is prefix of any other code.
(D) All of the above

151. Huffman coding technique is adopted for constructing the source code with ________ redundancy.
a. Maximum
b. Constant
c. Minimum
d. Unpredictable

152. Which bitmap file format/s support/s the Run Length Encoding (RLE)?
a. TIFF
b. BMP
c. PCX
d. All of the above

153. 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. Static Dictionary
b. Adaptive Dictionary
c. Both a and b
d. None of the above

154. **The correct encoding of the letter C in this tree is...**



a) 11
b) 10
c) 01
d) 00

155. Huffman trees use the ________________ of each character to work out their encoding.
a) Frequency
b) Order in ASCII
c) Number value

156. How do you move through a Huffman tree?
a) 0 = right 1= left
b) 1 = left 2 = right
c) 0 = left 1 = right
d) 0 = middle 1 = back

157. How do you calculate the number of bits of a body of text in ASCII?
Number of characters * 7
a) Number of characters (including spaces) *7

b) bits in Huffman * 7
c) bits in Huffman / 7

158. Which formula shows how to work out the percentage a file has been compressed by?
a) bits in (Huffman *7) /100
b) bits in ASCii - bits in Huffman
c) difference in bits / bits in ASCII * 100

159. Acording to Tom Scott, when is it NOT recommended using the Huffman tree technique?
a) With a long string of text
b) With a string of numbers
c) With a mix of different languages
d) With a short string of text

160. 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

161. The process of converting the analog sample into discrete form is called
a. Modulation
b. Multiplexing
c. Quantization
d. Sampling

162. A prefix code is a code in which
(a) some codewords are not proper prefixes of all codewords.
(b) no codeword is a proper prefix of itself.
(c) no codeword is a proper prefix of another codeword.
(d) no codeword is a proper prefix of the smallest length codeword.
(e) some codewords are not proper prefixes of some codeword

163. The code 1, 10, 110, 1110, 11110
(a) is not a prefix code because 11 is a prefix of 110.
(b) is a prefix code because 10 is not a prefix of any other codeword.
(c) is a prefix code because all codewords have different length.
(d) is not a prefix code because the codewords do not have the same length.
(e) is not a prefix code because 1 is a prefix of 10.

164. The code 11, 10, 110, 1110, 11110
(a) is not uniquely decodable.
(b) is a prefix code because it satisfies the Kraft's inequality.
(c) is uniquely decodable.
(d) is a prefix code because 10 is not a prefix of any other codeword.
(e) is not a code.
Explanation of uniquely decodable code:
https://www.youtube.com/watch?v=8aLHpFTHxp0

165. Which of the following is application of Huffman coding
a. Lossless image compression
b. Text compression
c. Audio compression
d. All the above

166. In the Tunstall code, all codewords are of equal length
a. True
b. False

167. Golomb and Rice coding are
a. lossy data compression method
b. lossless data compression method

168) Transportation of the data is easier due to ___________.
a) Decompression
b) compression
c) Transmission
d) Pixel

169) Due to compression , some of the ____________ is lost.
a) Network Network
b) Complexity Complexity
c) Data
d) Storage Storage

170) Coding time is ______due to compression and decompression.
a) Increased
b) Decreased
c) 0
d) None

171) No information is lost in ________ Compression
a) Lossless

b) Lossy
c) 0
d) None

172) Lossless Compression is used for ______
a) Text and data
b) Speed and Video
c)Text and Video
d) Speed and data

173) Lossy Compression is used for ______
a) Text and Video
b) Speed and Video
c) Text and data
d) Speed and data

174) Compression ratio is _____ in Lossless.
a) High
b) 1
c) Low
d) 0

175) Compression ratio is _____in Lossy.
a) High
b) 1
c) Low
d) 0

176) Huffman coding, runlength coding are examples for_______
a) Lossy compression
b) Lossless compression
c) Transmission
d) Pixel

177) Transform coding, vector quantization are examples for______
a) Pixel
b) compression
c) Transmission
d) Lossy compression

178) Lossless _________ Independent of Human Response.
a) Decompression
b) compression

c) Transmission
d) Pixel

179) Entropy Coding is an ________
a) Lossless
b) Lossy
c) 0
d) None

180) ______ 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

181) Compression Technique used in Text is
a) Huffman Coding
b) Transformation Coding
c) Entropy Coding
d) Differential Encoding

182) Compression Technique used in Image Video is
a) Huffman Coding
b) Transformation Coding
c) Entropy Coding
d) Differential Encoding

183) Lossy ________ Dependent upon Human Sensitivity
a) Transmission
b) Decompression
c) Pixel
d) compression

184) Compression Technique used in Audio is
a) Differential Encoding
b) Transformation Encoding
c) Entropy Coding
d) Differential & Transformation Encoding.

185) Expansion of LZ Coding is
a) Lossy
b) Lossless

b) Lempel-ziv-welsh
d) Lempel-ziv

186) Expansion of LZW Coding is
a) Lossy
b) Lossless
c) Lempel-ziv
d) Lempel-ziv-welsh

187) LZ Coding Formed by _______ String.
a) Appropriate
b) Appending
c) Appearing
d) Absolute.

188) _______ Coding Techniques are mainly based on audio perception mechanism.
a) Differential
b) Transformation
c) Entropy
d) Perceptual

189) The Perceptual coders use _______ model which exploit the limitation of human ear.
a) Sensitivity
b) Frequency
c) Psychoacoustic
d) MEPG

190) The strong Signal reduces level of sensitivity of the ear to other signals which are near to it in frequency is called _______ Masking
a) Spectral
b) Temporal
c) Critical
d) Frequency

191) When ear hears the loud sound, certain time has to be passed before it hears _______ Sound.
a) Louder
b) quieter
c) No Sound
d) None

192) _______ the frequency components that are below masking threshold.
a) Quantizer masks
b) Temporal mask
c) Frequency mask
d) Dolby

193) Temporal Masking is not present in
a) MPEG -2
b) MPEG -3
c) MPEG
d) MPEG -1

194) Dolby AC stands for
a) Dolby allocation coder
b) Dolby acoustic coder
c) Dolby adaptive coder
d) Dolby MPEG coder

195) Reduced compressed bit rate since frames does not include bit allocation in
a) Dolby -2
b) Dolby -3
c) Dolby -1
d) Dolby

196) _______ images are represented with the help of program.
a) Digitized
b) Picture
c) Graphical
d) video

197) _______ images are represented in the form of a two dimensional matrix.
a) Digitized
b) Picture
c) Graphical
d) video

198) Video compression is used for compression of moving _______ frames.
a) picture
b) Video
c) Audio
d) Speech

199) Pixel of 24-bit colour images is represented by 8-bits for each of _______ Colours.
a) Y, Cr and Cb
b) R,G, and B
c) Y, R, and G
d) R,G and Cb

200) GIF is used for representation and compression of _______ images.
a) Digitized
b) Picture
c) Graphical
d) video

201) GIF is represented as _______ Format
a) Graphics Interlaced
b) Graphics information
c) Graphics Interfered
d) Graphics Interchange

202) TIFF is represented as _______ Format
a) Tagged Image File
b) Target Image File
c) Tagged Import File
d) Target Import File

203) SIF is represented as _______ Format
a) Source Image
b) Source Interchange
c) Source Import
d) Source Input

204) CIF is represented _______ as Format
a) Common Image
b) Common Interchange
c) Common Import
d) Common Input

205) QCIF is represented as _______ Format
a) Quarter Common Image
b) Quarter Common Input
c) Quarter Common Import
d) Quarter Common Interchange

206) READ is represented as _______ Format
a) Relative Entity Address Designate Code
b) Relative Element Allocation Designate Code
c) Relative Element Address Decoder Code
d) Relative Element Address Designate Code

207) Baseline JPEG algorithm draw _______ after line until complete image.
a) Circle
b) Triangle
c) Line
d) None

208) Progressive algorithm draws the _______ image at once, JPEG but in very poor quality
a) Particular
b) Whole
c) Combined
d) Both a and b

209) An image is divided into 8x8 size, each 8x8 submatrix is called
a) Part
b) Potion
c) Block
d) Both a and b

210) A _______ consist of an information regarding start and end of the frame, its location in an image ect.
a) Block
b) Frame
c) Frequency
d) Device

211) The frame header contains an information regarding _______ of the image.
a) width/height
b) Dot
c) Line
d) Location

212) The DC coefficients have normally _______ amplitudes.
a) Small
b) Large
c) No
d) Both a and b

213) The AC coefficients are remaining _______ coefficients in each block.
a) 62
b) 65
c) 66
d) 63

214) I - Frame is encoded without reference to any other _______
a) Block
b) Frame
c) Frequency
d) Device

215) DCT stands for
a) Discrete Command Transform
b) Dialogue Cosine Transform
c) Discrete Cosine Transform
d) Dialogue Command Transform

216) _______ value = Round value X Threshold .
a) Quantized
b) Dequantized
c) Compressed
d) Uncompressed

217) Reconstructed image is _______ same as original one.
a) exactly
b) not exactly
c) Particularly
d) None

218) The frame decoder identifies a particular frame and give information to
a) Inverse DCT
b) Dequantization
c) Both a and b
d) Image Builder

219) _______ = DCT coefficient - Dequantized value.
a) Quantization Process
b) Quantization error
c) Quantization Percentage
d) Quality Process

220) The GIF image can be transferred over the network in _______
a) interlaced image
b) interlaced mode
c) interchange mode
d) interchange image

221. _____is an abbreviation for binary digit.

A. 0 and 1

B. bingit

C. base

D. bit

222. Unit of information is _______

a)Bytes

b) bytes/message

c) bits

d) bit

223. In more uncertainty about the message, information carried is _____

a) less

b) more

c) very less

d) both a&b

224. If receiver knows the message being transmitted, the amount of information carried is_______

a)1

b) 0

c) -1

d) 2

225. Amount of Information is represented by ______

a) IK

b)pK

c) 1/ pK

d) H

226. Information Rate is represented by_____

a) r

b) rH

c) R

d) rR

227. Source Coding Theorem is represented by_____

a) Huffman's 1st theorem

b) Shannon's 1st theorem

c) Shannon's 2nd theorem

d) Both a & b

228. The codeword generated by the encoder should be

a) Digits in Nature

b) Codes in Nature

c) Binary in Nature

d) Values in Nature

229. Coding Efficiency of the source encoder is defined as _____

a) $\eta = N_{min}/\overline{N}$

b) $\eta = H/N$

c) $N \geq H$

d) $\eta = H(X^2)/N$

230. Code redundancy is represented by_____

a) γ

b) $1- \gamma$

c) γ^2

d) σ

231. Code Variance is represented by_____

a) σ -1

b) P_k

c) $\sigma 2$

d) $\eta 2$

232. Variable length coding is done by source encoder to get______
a) Lower efficiencies
b) Higher efficiencies
c) Moderate efficiencies
d) Both a&b

233. Prefix Code Satisfies_______
a) McMillan inequality
b) Shannon's 1st Theorem
c) Huffman Coding
d) Shannon's 2nd Theorem

234. The conditional entropy H(Y/X) IS Called______
a) Uncertainty
b) Information
c) Equivocation
d) Certainty

235. Mutual Information is represented as________
a) I(X/Y)
b) I(X;Y)
c) I(X,Y)
d) I(X:Y)

236. MPEG Stands for _________
a) Media Picture Experts Group
b) Motion Picture Experts Group
c) Media Picture Export Group
d) Media Video Experts Group

237. JPEG is an image compression standard which was accepted as an international standard in ______
a)1993
b) 1994
c) 1992
d) 1995

238. Rate distortion theory is concerned with the trade-offs between distortion and rate in

a. lossy compression schemes

b. lossless compression schemes

239. The technique(s) for lossless compression?

a. Huffman coding

b. Shannon fano coding

c. Arithmetic coding

d. All the above

240. The technique(s) for lossy compression?

a. Subband coding

b. Wavelet based compression

c. JPEG

d. All the above

241. What are the types of quantization error?

a. Granular error

b. Slope over load error

c. Both a & b

d. None of the above

242. What are the types of quantizer?

a. Midrise quantizer

b. Midtread quantizer

c. Both a & b

d. None of the above

243. What are the types of adaptive quantization?

a. forward adaptive quantization

b. backward adaptive quantization

c. Both a & b

d. None of the above

244. Which is a quantization process?

a) Rounding

b) Truncation
c) Rounding & Truncation
d) None of the mentioned

245. Quantization is a ______ process.
a) Few to few mapping
b) Few to many mapping
c) Many to few mapping
d) Many to many mapping

246. Quantization is a ______ process.
a) Non linear
b) Reversible
c) Non linear & Reversible
d) None of the mentioned

247. Which conveys more information?
a) High probability event
b) Low probability event
c) High & Low probability event
d) None of the mentioned

248. 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

249. 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

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

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

251. If the input analog signal falls outside the range of the quantizer (clipping), eq (n) becomes unbounded and results in _____________
a) Granular noise
b) Overload noise
c) Particulate noise
d) Heavy noise

252. 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 eq (n)?
i. The error eq (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 eq (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

253. 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

254. What is the scale used for the measurement of SQNR?
a) DB
b) db
c) dB
d) All of the mentioned

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

a) 10 $\log_{10}$(Px/Pn)

b) 10 log10(Pn/Px)

c) 10 log2(Px/Pn)

d) 2 log2(Px/Pn)

256. In the equation SQNR = 10 $\log_{10}$(Px/Pn). what are the terms Px and Pn 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

257. In the equation SQNR = 10$\log_{10}$(Px/Pn), what are the expressions of Px and Pn?

a) $Px=\sigma^2=E[x^2(n)]$ and $Pn=\sigma^2_e=E[e^2q(n)]$

b) $Px=\sigma^2=E[x^2(n)]$ and $Pn= \sigma^2_e=E[e^3q(n)]$

c) $Px=\sigma^2=E[x^3(n)]$ and $Pn= \sigma^2_e=E[e^2q(n)]$

d) None of the mentioned

258. If the quantization error is uniformly distributed in the range (-Δ/2, Δ/2), the mean value of the error is zero then the variance Pn is?

a) $Pn= \sigma^2_e=\Delta^2/12$

b) $Pn= \sigma^2_e=\Delta^2/6$

c) $Pn= \sigma^2_e=\Delta^2/4$

d) $Pn= \sigma^2_e=\Delta^2/2$

259. By combining Δ=R2b+1 with Pn=σ2e=Δ2/12 and substituting the result into SQNR = 10 log10PxPn, 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$\log_{10}(R/\sigma_x)$

260. 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

261. 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.

262. 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.

263. 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.

264. 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).

265. 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.

266. 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.

267. 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).

268. 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.

269 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.

270. 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.

271. Which of the following statements is true for Lloyd quantizers:
a. The input signal and output (reconstructed) signal are uncorrelated.
b. The input signal and the quantization error are uncorrelated.
c. The output (reconstructed) signal and the quantization error are uncorrelated.

272. 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. The vector quantizer performance is independent of N.
b. By doubling the dimension N, the bit rate for the same distortion is halved.
c. For N approaching infinity, the quantizer performance asymptotically approaches the rate-distortion function (theoretical limit).

273. 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.

274. Assume the decision thresholds $\{u_i\}$ for a scalar quantizer are given and we want to derive the optimal reconstruction levels $\{s_i'\}$ for minimizing the MSE distortion. The pdf of the input signal is denoted by f (s). How are the optimal reconstruction levels derived?

a. $\mathbf{s_i' = [\int_{Ui}^{Ui+1} S.f(s)ds\ ]\ /\ [\int_{Ui}^{Ui+1} f(s)ds]}$

b. $s_i' = (u_i + u_{i+1})/2$

c. $s_i' = u_i + (f(u_{i+1})/2)$

275. Assume we want to design a quantizer with 256 quantization intervals, where the quantization indices are transmitted using fixed-length codes (using an 8-bit codeword per index). The reconstruction levels $\{s_i'\}$ are given. How should we set the decision boundaries $\{u_i\}$for minimizing the distortion of the quantizer?

a. $\mathbf{u_i = (s_{i-1}+s_i)/2}$

b. $u_i = s_i-(1/2)$

c. $u_i = s_i-\sqrt{(Si\ - Si - 1\ )^2 + (Si + 1\ - Si)^2}$

276. Uniform quantizer is also known as

a) Low rise type

b) Mid rise type

c) High rise type

d) None of the mentioned

277. 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

278. Prediction gain _____ for better prediction.

a) Increases

b) Decreases

c) Remains same

d) None of the mentioned

279. Delta modulation is

a) 1 bit DPCM

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

280. 1 bit quantizer is a
a) Hard limiter
b) Two level comparator
c) Hard limiter & Two level comparator
d) None of the mentioned

281. If step size is increased ______ occurs.
a) Slope overload distortion
b) Granular noise
c) Slope overload distortion & Granular noise
d) None of the mentioned

282. Which helps in maintaining the step size?
a) Delta modulation
b) PCM
c) DPCM
d) Adaptive delta modulation

283. 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

284. 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

285. The theoretical gain in zero crossing TED is greater than early late TED.
a) True

b) False

286. Non uniform quantizer _______ distortion.
a) Increases
b) Decreases
c) Does not effect
d) None of the mentioned

287. Vector quantization is used in
a) Audio coding
b) Video coding
c) Speech coding
d) All of the mentioned

288. The spectral density of white noise is
a) Exponential
b) Uniform
c) Poisson
d) Gaussian

289. The probability density function of the envelope of narrow band noise is
a) Uniform
b) Gaussian
c) Rayleigh
d) Rician

290. The type of noise that interferes much with high frequency transmission is
a) White
b) Flicker
c) Transit time
d) Shot

291. Thermal noise power of a resistor depends upon
a) Its resistance value
b) Noise temperature
c) Bandwidth
d) Ambient temperature

292. The size of the quantile interval is called as
a) Inter level
b) Step size
c) Quantile size
d) Level width

293. Uniform quantization provides better quantization for
a) Weak signals
b) Strong signals
c) Weak & Strong signals
d) None of the mentioned

294. Non uniform quantization provides better quantization for
a) Weak signals
b) Coarse signals
c) Weak & Coarse signals
d) None of the mentioned

295. In non uniform quantization, the quantization noise is _______ to signal size.
a) Inversely proportional
b) Directly proportional
c) Equal
d) Double

296. 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

297. Companding is the process of
a) Compression
b) Expansion
c) Compression & Expansion
d) None of the mentioned

298. Which value of μ corresponds to linear amplification?

a) μ=0

b) μ=1

c) μ>0

d) μ<0

299. What is the standard value of μ in μ-law ?

a) 128

b) 255

c) 256

d) 0

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

a) 87

b) 88

c) 86.7

d) 87.6

301. 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

302. 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

303. 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

304. 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

305. 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

306. Which among the following compression techniques is/are intended for still images?
a. JPEG
b. H.263
c. MPEG
d. All of the above

307. Lempel–Ziv–Welch (LZW) Algorithm is used for
a. lossless compression
b. lossy compression

308. Lempel–Ziv–Welch (LZW) Algorithm is used to compress
a. GIF
b. PDF
c. TIFF
d. All the above

309. GIF stands for
a. Graphical Interface Format
b. Graphical Interchange Format
c. Graphical Intrachange Format
d. Graphical Interlinked Fomat

310. GIF uses ________ dictionary for compressing data.
a. Static

b. Adaptive/Dynamic
c. Both a & b
d. None of the above

311. JBIG2 compression is
a. lossless compression
b. lossy compression

312. LZ77 and LZ78 are the two _______ data compression algorithms.
a. lossless
b. lossy

313. 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

314. 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

315. 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