

26 Lecture - CS301

Important Mcqs

1. Which of the following is a lossless data compression algorithm?

- a) Huffman encoding
- b) Arithmetic encoding
- c) Run-length encoding
- d) All of the above

Answer: d) All of the above

2. In Huffman encoding, the symbols to be encoded are represented as what?

- a) A binary tree
- b) A prefix code
- c) A suffix code
- d) None of the above

Answer: a) A binary tree

3. What is the goal of Huffman encoding?

- a) To compress data by representing frequently occurring symbols in a compressed form
- b) To convert data from analog to digital form
- c) To encrypt data for secure transmission
- d) None of the above

Answer: a) To compress data by representing frequently occurring symbols in a compressed form

4. How is the Huffman tree built?

- a) By merging the two most frequent symbols at each step
- b) By merging the two least frequent symbols at each step
- c) By randomly selecting symbols to be included
- d) None of the above

Answer: b) By merging the two least frequent symbols at each step

5. Which of the following is NOT a property of the Huffman code?

- a) Prefix-free
- b) Uniquely decodable
- c) Provides a compact representation of the original data
- d) Lossy compression

Answer: d) Lossy compression

6. What is a prefix code in Huffman encoding?

- a) A code in which no codeword is a prefix of any other codeword
- b) A code in which each symbol is represented by the same number of bits

- c) A code in which the codewords are sorted in order of frequency
- d) None of the above

Answer: a) A code in which no codeword is a prefix of any other codeword

7. **Which of the following is a disadvantage of Huffman encoding?**

- a) It requires the entire input to be available at once
- b) It is slow to encode and decode
- c) It cannot be used with binary data
- d) None of the above

Answer: a) It requires the entire input to be available at once

8. **What is the time complexity of building a Huffman tree?**

- a) $O(n)$
- b) $O(n \log n)$
- c) $O(n^2)$
- d) None of the above

Answer: b) $O(n \log n)$

9. **What is the space complexity of building a Huffman tree?**

- a) $O(n)$
- b) $O(\log n)$
- c) $O(n \log n)$
- d) None of the above

Answer: a) $O(n)$

10. **Which of the following is an application of Huffman encoding?**

- a) Lossy audio compression
- b) Lossless image compression
- c) Data encryption
- d) None of the above

Answer: b) Lossless image compression