**MCQ Questions No. 1 (Source Coding and Compression)**

1. What is the primary goal of data compression?

a) Error detection

b) Error correction

c) Reducing data size

d) Increasing data size

**The answer: c**

2. Which coding technique assigns shorter codes to more frequent symbols?

a) Huffman coding

b) Shannon-Fano coding

c) Run-length encoding (RLE)

d) Lempel-Ziv-Welch (LZW) coding

**The answer: a and b**

3. Who is known as the father of Information Theory?

a) Claude Shannon

b) Alan Turing

c) Isaac Newton

d) Albert Einstein

**The answer: a**

4. What is the fundamental unit of information?

a) Bit

b) Byte

c) Kilobyte

d) Megabyte

**The answer: a**

5. What does the term "entropy" represent in Information Theory?

a) Information gain

b) Information loss

c) Uncertainty or randomness

d) Data compression

**The answer: c**

6. What is the formula for Shannon's entropy (H) for a discrete random variable?

a) H = - ∑ p(x) log2 p(x)

b) H = ∑ p(x) log2 p(x)

c) H = - ∑ p(x) log10 p(x)

d) H = ∑ p(x) log10 p(x)

**The answer: a**

7. What does the term "conditional entropy" represent?

a) Uncertainty about one variable given another

b) Uncertainty about one variable without knowing another

c) Mutual information between two variables

d) Self-information of a variable

**The answer: a**

8. Which data compression technique uses variable-length codes?

a) Huffman coding

b) Shannon-Fano coding

c) Run-length encoding (RLE)

d) Lempel-Ziv-Welch (LZW) coding

**The answer: a and b**

9. What is the primary goal of source coding?

a) Error detection

b) Error correction

c) Data compression

d) Data encryption

**The answer: c**

10. Which of the following is not decodable code?

a) Huffman Code

b) Fano Code

c) Fixed Length Code

d) All are decodable codes

**The answer: c**