

Lecture Section:

Monday, Nov 03, 2025

Student Name:

PSU Email ID:

1. (2 pts.) In Huffman encoding, the symbol with the minimum frequency gets the least number of bits.

- a True
- b False

2. (2 pts.) Using Huffman encoding, how many bits (0 or 1) are needed to store the 20-symbol string represented by the following table of symbols and frequencies?

Symbol	Frequency
A	10
B	4
C	2
D	4

- a 18
- b 34
- c 36
- d 38

3. (2 pts.) Huffman encoding does which of the following?

- a Encodes the input data
- b Compresses the input data
- c All of the above

4. (2 pts.) Given the Set Cover instance with items $B = \{1, 2, 3, 4, 5\}$ and sets $S_1 = \{3, 4, 5\}$, $S_2 = \{2, 4, 5\}$, $S_3 = \{1, 5\}$, $S_4 = \{1, 3\}$, what is the optimal (minimum) number of sets needed to cover all the items?

- a 1
- b 2
- c 3
- d 4

5. (2 pts.) In the greedy set cover algorithm, what is the greedy choice at each step?

- a Selecting largest set by cardinality.
- b Selecting the set that covers the fewest uncovered elements.
- c Selecting the set that covers the most uncovered elements per unit cost.
- d Selecting the smallest set by cardinality.