Question - 1

Quick Find

SCORE: **5 points**

What is the time complexity of find operation in Quick Find.

- [ ] N
- [ ] N/2
- [x] 1
- [ ] N^2

Question - 2

Huffman Coding

SCORE: **5 points**

David Huffman devised a simple binary tree to minimize the average length of a message, which is known as Huffman Coding.
How many bits will be used to encode the message "beep-boop-beer" with Huffman codes?
The message starts with "b" and ends with "r".

- [x] 35
- [ ] 36
- [ ] 37
- [ ] 39

Question - 3

Selection Sort

SCORE: **5 points**

Given an array in reverse order [6, 5, 4, 3, 2, 1], what are the steps in selection sort?

- [x] 1 5 4 3 2 6, 1 2 4 3 5 6, 1 2 3 4 5 6
- [ ] 3 5 4 6 2 1, 3 2 4 6 5 1, 3 2 1 6 5 4, 1 2 3 4 5 6
- [ ] 5 6 4 3 2 1, 4 5 6 3 2 1, 3 4 5 6 2 1, 2 3 4 5 6 1, 1 2 3 4 5 6
- [ ] 6 5 4 3 1 2, 6 5 4 1 2 3, 6 5 1 2 3 4, 6 1 2 3 4 5, 1 2 3 4 5 6

Question - 4

SCORE: **5 points**

Weighted Quick Union

In the "Weighted Quick Union" algorithm, we link the root of the smaller tree to the root of larger tree at every union operation. In the worst case, for N elements, what's the maximum depth of all leaves? [The depth of a single node is 0].

- O(N)
- O(sqrt(N))
- O(lgN)
- O(lgN+1)

Question - 5

SCORE: **30 points**

Weighted quick union

Implement the *find* and *union* methods for the weighted quick union algorithm