Select all the correct answers from the list below about the Huffman code generated for this example.

- [ ] b_A = 1 bit since A is the most frequent character.
- [x] The construction of Huffman code will first merge D and E into a subtree.

Correct
Correct

- [x] $b_A = b_B = 2$

Correct
Correct

- [x] $b_C = 2$

Correct

- [x] The average number of bits per character for the Huffman code is 2.2 bits/character

Correct
Correct: 2 * 0.35 + 2 * 0.25 + 2 * 0.2 + 3 * 0.15 + 3 * 0.05 = 2.2

- [ ] D and E are assigned 4 bits each in the prefix code.

2. Select all the correct facts about the behavior of the Huffman coding algorithm given a set of characters $A_1, \ldots, A_n$ and their frequencies $f_1, \ldots, f_n$.

2 / 2 points

- [x] The character with lowest frequency will always have the highest number of bits assigned.

  Correct
  Correct: this is needed for optimality since if this were not the case, we can always swap the code for the lowest freq. character with the character that got the highest number of bits and get a code that achieves better # bits/char.

- [ ] The highest frequency character will always be assigned 1 bit in the Huffman code.

- [x] The character with second lowest frequency will also have the highest number of bits assigned.

  Correct
  Correct.

- [x] Suppose $n = 32$ and we assign 5 bits to each character. A Huffman code will always assign 5 or fewer bits per character, on average.

  Correct
  Correct: since assigning 5 bits per character is also a prefix-code.