**Problem 5**

|  |  |  |
| --- | --- | --- |
| Letter | Frequency | Encode |
| A | 20 | 00 |
| B | 29 | 10 |
| C | 10 | 010 |
| D | 2 | 111110 |
| E | 3 | 111111 |
| F | 4 | 11110 |
| G | 9 | 1110 |
| H | 11 | 011 |
| I | 12 | 110 |

Total bits:

20\*2 + 29\*2 + 10\*3 + 2\*6 + 3\*6 + 4\*5 + 9\*4 + 11\*3 + 12\*3 = 283

The result is :

(('A', ('C', 'H')), ('B', ('I', ('G', ('F', ('D', 'E'))))))