**MAA507 – Seminar 1 Preparation Exercises**

**Elif Cemre Durgut**

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**1.1**

We choose two nodes that are least frequent in each round and label the edges as 0 and 1.

|  |  |
| --- | --- |
| a | 000 |
| b | 010 |
| c | 110 |
| d | 1 |
| e | 100 |

Diagram

Description automatically generated

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**1.2**

**i)**

**001000001101** 🡪 6, 13

00 means the next 2 digits after the leading 1 🡪 100 🡪 6

000 means the next 3 digits after the leading 1 🡪 1101 🡪 13

**ii)**

54 in binary 🡪 **110110** 🡪 6 digits

6 in Elias Gama 🡪 **00110**

54 in Elias Delta 🡪 **0011010110**

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**1.3**

In arithmetic encoding, the interval is divided into parts based on the probabilities of the characters in the alphabet. Then, according to the characters in the word to be encoded, the correct part is chosen, and it is divided into subintervals. This process is repeated until the last character. Finally, we can choose our codeword from that last interval.

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