Cairo University **Faculty of Computers and Artificial Intelligence**

Data Compression **Third year (2022-2023)**

(Fall 2022)

Sheet 3 Arithmetic Coding

Question-1

Use floating point arithmetic coding algorithm to encode the following stream <AABCB> given that P(A)=0.6,P(B)=.2,P(C)=0.2

Question-2

Use binary arithmetic coding algorithm to encode the following stream <AABCB> given that P(A)=0.6,P(B)=.2,P(C)=0.2

Question-3

The binary representation output of the Arithmetic Coding Algorithm is "111 101 010 00". The compressed symbols are 1,2, and 3 with probabilities p(1)=0.7, p(2)=0.1, and p(3)=0.2. Decompress the binary stream to detect the original data. Indicate the scaling operations and the word length calculations.

Question-4

Decompress the following binary stream [011000] generated using binary arithmetic coding algorithm. Given Prob(a)=0.7, Prob(b)=0.2, and Prob(c)=0.1