Weekly Assignment 9

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-11-18, 23:59 IST.

These questions are based on the Week-9 video lectures. Please use discussion forum in case you have any doubt.

For Q2-4A, you can assume that the empty sequence (ØN) is valid codeword.

1) Given a prefix-free code which assigns codeword of length $i$, to symbol $i \in [n]$, which of these always hold? (log stands for log base 2.)
   - $\sum_{i=1}^{n} \log i \geq 0$
   - $\sum_{i=1}^{n} \log i \leq 0$
   - $2^n \leq 1$
   - $2^n > 2^{n^2} + 2^n \leq 1$
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - $2^n \leq 1$
     - $2^n > 2^{n^2} + 2^n \leq 1$

2) Consider a source $X$ with pmf
   $P(0) = 1/3, P(1) = P(3) = 1/8, P(5) = P(4) = P(6) = 1/16$. What is the value of $I(X)$?
   - $0.14$
   - $0.12$
   - $2$
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - $0.14$

3) Consider a source $X$ with pmf
   $P(0) = 1/2, P(1) = P(3) = 1/8, P(5) = P(4) = P(6) = 1/16$. What is the value of $U'(X)$?
   - $0.34$
   - $0.14$
   - $2$
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - $0.34$

4) Consider a source $X$ with pmf
   $P(0) = 1/2, P(1) = P(2) = 1/8, P(5) = P(4) = P(6) = 1/16$. What is the value of $I_{8/24}(X)$?
   - $0.34$
   - $0.14$
   - $2$
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - $0.34$

5) Consider a source $X$ with pmf
   $P(0) = 1/3, P(2) = 1/6, P(3) = 1/6, P(4) = 1/3$. Which of the following is the Huffman code for this source?
   - $1 \rightarrow 001$
   - $2 \rightarrow 0110$
   - $3 \rightarrow 1001$
   - $4 \rightarrow 110$
   - $1 \rightarrow 110$
   - $2 \rightarrow 0110$
   - $3 \rightarrow 1001$
   - $4 \rightarrow 001$
   - $1 \rightarrow 110$
   - $2 \rightarrow 0110$
   - $3 \rightarrow 1001$
   - $4 \rightarrow 000$
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - $1 \rightarrow 001$
     - $2 \rightarrow 0110$
     - $3 \rightarrow 1001$
     - $4 \rightarrow 110$
     - $1 \rightarrow 110$
     - $2 \rightarrow 0110$
     - $3 \rightarrow 1001$
     - $4 \rightarrow 001$