

## Quiz 1 - Information and Communication 2021

Prasad

Q1: (3+10 = 13 marks, 13 mins) Define the K-L divergence  $D(p_1||p_2)$  between two distributions  $p_1$  and  $p_2$ . Using a fact shown in the class regarding the K-L divergence, show that  $H(X, Y) \leq H(X) + H(Y)$  in general, and this holds with equality **if and only if**  $X$  **and**  $Y$  are independent.