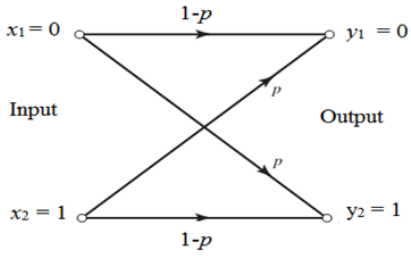
THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY, PATIALA

Department of Electronics and Communication Engineering

UEC310 – Information and Communication Theory

TUTORIAL - 11

Q1	Determine the channel capacity of Binary Symmetric Channel and discuss the following case: ➢ **When channel is noise –free, p = 0,** ➢ **When channel is noisy and p =1/2** ➢ **When channel is 100 % noisy and p = 1** 
Q2	For an audio communication channel, the SNR is 10 dB, and the transmission bandwidth is 3.2 kHz. What will be the channel capacity and Shannon Limit
Q3	Consider a DMS X with symbols $x_i, i = 1,2,3,4$. Following are the four possible binary codes: (a) Determine which codes are prefix code by using Kraft inequality. (b) Determine which codes are uniquely decodable.
Q4	Consider a DMS X has five symbols x1 to x5 with probabilities 0.4, 0.19, 0.16, 0.15, and 0.1. construct a Huffman code and determine the efficiency of code

x_i	Code *A*	Code *B*	Code *C*	Code *D*
x_1	00	0	0	0
x_2	01	10	11	100
x_3	10	11	100	110
x_4	11	110	110	111