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Courses » Principles of Digital Communications

Announcements **Course** Ask a Question Progress Mentor FAQ

Unit 3 - Week 2

Course outline

How to access the portal

Week 1

Week 2

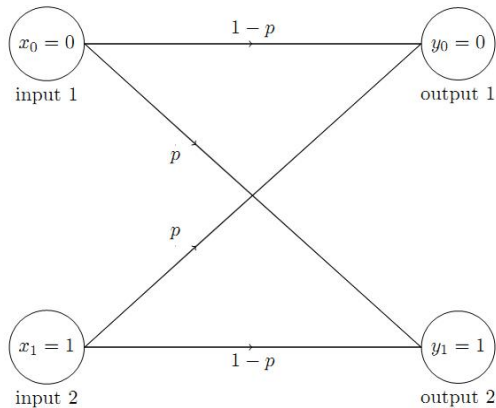
- Lecture 7 : Discrete Memory-less Channels : Mutual Information
- Lecture 8 : Channel Capacity-I
- Lecture 9 : Channel Capacity-II
- Lecture 10 : Channel Coding Theorem
- Lecture 11 : Differential Entropy-I
- Lecture 12 : Differential Entropy-II
- Quiz : Assignment 2
- Weekly Feedback

Assignment 2

The due date for submitting this assignment has passed.

As per our records you have not submitted this assignment. **Due on 2018-08-15, 23:59 IST.**

1) A binary symmetric channel (BSC) with crossover probability p is shown in the figure below. **1 point**



Two BSCs with the same crossover probability are cascaded such that the output of channel-1 is fed as input to channel-2. The overall capacity of the equivalent channel in terms of the entropy function $H(p)$ is

- $2H(p(1-p))$
- $H(2p(1-p))$
- $1 - 2H(p(1-p))$
- $1 - H(2p(1-p))$

No, the answer is incorrect.

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Week 4

Week 5

Week 6

Week 7

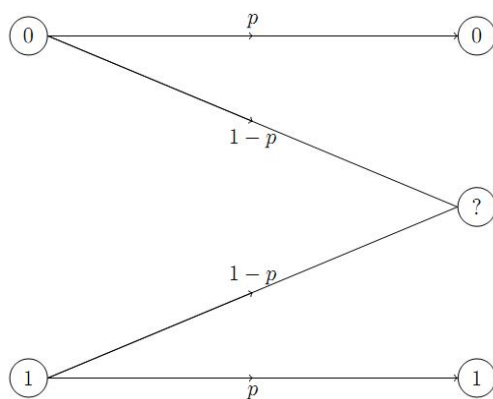
Week 8

Week 9

Week 10

Week 11

Week 12



The capacity of the channel in terms of p is

- $1 - p$
- 1
- p
- $p/2$

No, the answer is incorrect.

Score: 0

Accepted Answers:

p

3) The probability density function $p(x)$ which maximizes the differential entropy $h(X)$, such **1 point** that the corresponding signal satisfies the constraints $x(t) \geq 0$ and $x(t)^2 = S$,

- $\frac{2}{\sqrt{2\pi S}} e^{-\frac{x^2}{2S}} u(x)$
- $\frac{1}{\sqrt{2\pi S}} e^{-\frac{x^2}{2S}}$
- $\frac{1}{S} e^{-\frac{x}{S}} u(x)$
- Uniformly distributed in the interval $[0, 2S]$.

No, the answer is incorrect.

Score: 0

Accepted Answers:

$\frac{2}{\sqrt{2\pi S}} e^{-\frac{x^2}{2S}} u(x)$

4) A continuous random variable X has a peak magnitude M . The differential entropy of X is maximum when the distribution of X is **1 point**

- Gaussian
- Uniform
- Exponential
- Rayleigh

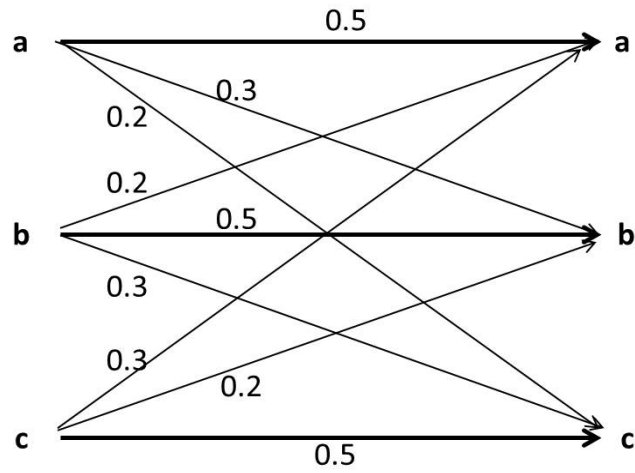
No, the answer is incorrect.

Score: 0

Accepted Answers:

Uniform

5) The capacity (bits/transmission) of the channel shown in the figure below is



No, the answer is incorrect.

Score: 0

Accepted Answers:

(Type: Range) 0.09,0.1

1 point

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