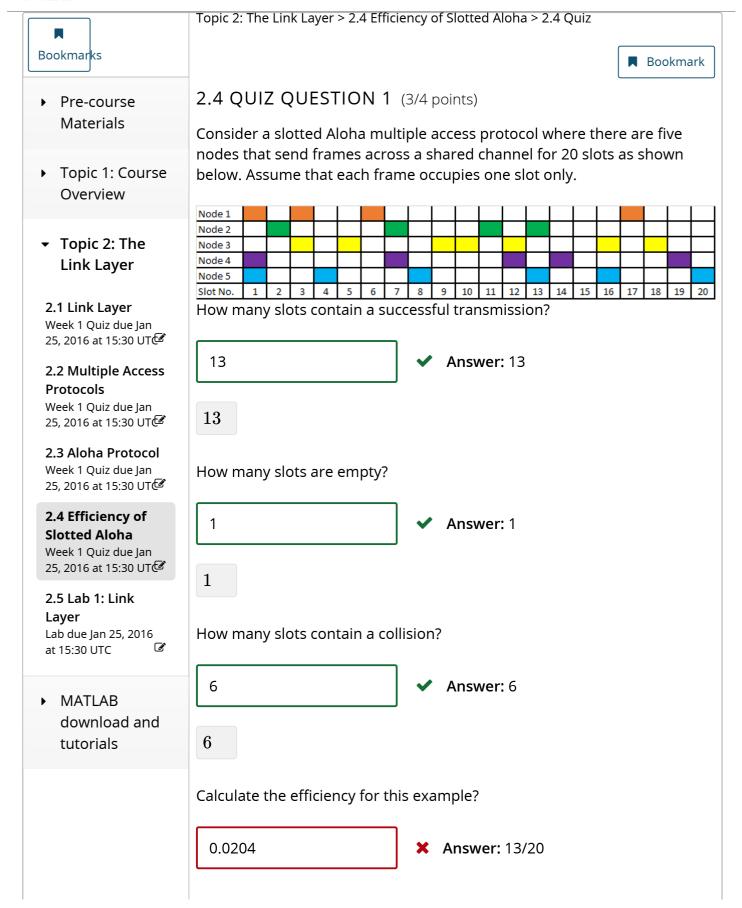


HKUSTx: ELEC1200.3x A System View of Communications: From Signals to...



0.0204

EXPLANATION

Total number of successful transmitted frame = 13.

Total slot = 20.

Efficiency = 13/20.

You have used 3 of 3 submissions

2.4 QUIZ QUESTION 2 (1/1 point)

Consider a communication link that implements a slotted Aloha multiple access protocol. If there are 6 backlogged nodes, each transmitting with probability 0.3 in each time slot, what is the numerical value of the efficiency of this link to two decimal places (e.g. 0.11)?

0.30

Answer: 0.30

0.30

EXPLANATION

p=0.2 and N=6

Probability that a node is successful in a slot = $p((1-p)^{N-1})$

Probability that any node is successful in a slot = $Np((1-p)^{N-1})$

Efficiency = $1.8*(0.7^5) = 0.30$

You have used 1 of 3 submissions

2.4 QUIZ QUESTION 3 (1/1 point)

2.4 Quiz Question 1 | 2.4 Efficiency of Slotted Aloha | ELEC1200.3x Courseware | edX

What is the numerical value of the maximum efficiency in the link described above to two decimal places? Assume each node transmits with the optimal probability to maximize efficiency.

0.40

Answer: 0.40

0.40

EXPLANATION

Maximum is obtained when the derivative of $Np((1-p)^{N-1})$ with respect to p is set to zero.

$$p*(N-1)*((1-p)^{N-2})*(-1)+(1-p)^{N-1}=0$$

Derivative is zero when p = 1/6, so when each node transmits with the optimal probability, the maximum efficiency is (5/6)^5=0.40

You have used 1 of 3 submissions

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