

EERI423 Exam breakdown 2013-2016

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1 2016

- Question 1
 - Elements of a communication system
 - Block diagram of a phase locked loop synth
- Question 2
 - Square law mixer
 - Receiver noise calcs
 - Image frequency
 - Block diagram modern direct conversion Receiver
- Question 3
 - Duplexing
 - Shannon-Hartley eqn
 - Fading margin
 - LTE
- Question 4
 - Power budget
- Question 5
 - Cellular systems

2 2015

- Question 1
 - Baseband vs broadband multiplexing
 - Quantizing noise
- Question 2
 - Block diagram of a modern digital transmitter
 - Block diagram of a direct digital synthesizer
 - Receiver noise calcs theory
 - SDR
 - Mixer in a digital synth
 - Automatic gain control
- Question 5
 - Cellular systems

3 2014

- Question 1
 - Form factor of a band pass filter
 - Insertion Loss
 - Multiplexing
 - Adding up gains
- Question 2
 - Block diagram of a typical FM transmitter
 - Variable modulus transmitter
 - Block diagram of a double heterodyne transmitter
 - Receiver noise calcs

- Question 3
 - theory
 - RZ encoding
 - Multiplexing, (“normal binary channel?!”)
 - GMSK
 - FDD vs TDD
 - OFDM
 - Shannon-Hartley eqn
 - Question 4
 - Path loss
 - Question 5
 - Cellular systems
 - Question 3
 - 3 advantages of spread spectrum
 - Block diagram of a carrier recovery circuit for BPSK modulation
 - Shannon-Hartley eqn
 - Question 4
 - Path loss
 - Question 5
 - Cellular systems
- #### 4 2013

 - Question 1
 - 4 elements of any communication channel
 - Compander w.r.t speech signals
 - Compander calc
 - Question 2
 - Block diagram of a modern digital transmitter
 - Problem with fixed prescalers in synths
 - Receiver noise calcs
 - Question 3
 - 2 types of spread spectrum

5 List of block Diagrams

6 Cellular systems

7 Path Loss

8 Receiver Noise

9 Shannon Hartley

 - $C = 2B$ Where C is the capacity in bps and B is the bandwidth in Hertz
 - It assumes only 2 encoding levels are used, i.e. High=1 and low=0
 - $C = 2B \log_2 N$ Where N is the number of encoding levels
 - $C = B \log_2 \left(1 + \frac{S}{N}\right)$ Where $\frac{S}{N}$ is the SNR *As a ratio, not as DB*

Consider compiling exam theory questions into flash cards, current flash cards too many