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NPTEL

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Courses » LDPC and Polar Codes in 5G Standard

Announcements **Course** Ask a Question Progress FAQ

Unit 14 - Week 3 Assignments

Register for Certification exam

Course outline

- How to access the portal
- Matlab access and Learning Modules
- Week 0 : Introduction to Error Correction Codes
- Week 0 : Linear Binary Block Codes
- Week 0 : Assignment
- Join the 5G Revolution in India
- Week 1: LDPC Codes for 5G
- Week 1: 5G Standard
- Week 1: Assignments
- Week 2: Building Blocks for

Matlab Assignment 3

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2019-02-27, 23:59 IST.

1) Consider a (16,13) polar code constructed using the reliability sequence as provided in the 5G standard(link to reliability_sequence.txt). Find the generator matrix for this code in systematic form: $G_{\text{sys}} = [\, I_{13} \quad P \,]$, where I_{13} is the 13×13 identity matrix and P is a 13×3 matrix. **5 points**

You can find the systematic form by following the following steps:

- Compute $G_{16} = G_2^{\otimes 4}$, where $G_2 = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and $\otimes$ denotes the Kronecker product.
- From G_{16}, remove the rows which correspond to frozen bit positions to obtain the generator matrix G.
- Convert G to systematic form by performing Gaussian elimination. Remember **not** to do any column swaps during Gaussian elimination.

The number of non-zero entries in the P part of the systematic generator matrix $G_{\text{sys}} = [\, I_{13} \quad P \,]$ and the minimum distance of the code are respectively:

- 23 , 3
- 19 , 2
- 17 , 3
- 21 , 2

No, the answer is incorrect.
Score: 0

Accepted Answers:
21 , 2

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