



## Unit 3 - Week-2

### Course outline

#### How to access the portal

#### Week-1 Introduction to error control coding

#### Week-2

- Decoding of Linear Block Codes
- Distance Properties of Linear Block Codes-I
- Distance Properties of Linear Block Codes-II
- Problem Solving Session
- Quiz : Assignment 2
- Assignment-2 Solutions

#### Week-3

#### Week-4

## Assignment 2

The due date for submitting this assignment has passed. **Due on 2016-03-29, 23:55 IST.**

### Submitted assignment

1) A linear block code is specified by its parity check matrix  $\mathbf{H}$  as given below (use the same matrix for question number 1 to 4) 1 point

$$\mathbf{H} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

Then, minimum distance of the code is 4.

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*True*

2) Code can simultaneously correct single error and detect double errors. 1 point

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*True*

3) Code has equal number of odd and even weight codewords. 1 point

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*False*

4) Code can simultaneously correct 2 errors and 1 erasure 1 point

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*False*

5) A linear block code is specified by parity check matrix (use the same matrix for question number 5 to 7)

**1 point**

$$\mathbf{H} = \begin{bmatrix} 0 & 0 & 0 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 & 1 & 0 \end{bmatrix}$$

Then, 001001 and 001000 can be coset leader.

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*True*

6) Code can correct double errors.

**1 point**

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*False*

7) Syndrome corresponding to error pattern 100000 is 100.

**1 point**

- True  
 False

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*False*

8) A linear block code is described by the generator matrix (use same matrix for question number 8 to 10)

**1 point**

$$\mathbf{G} = \begin{bmatrix} 1 & 1 & 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

The codewords are sent over a binary symmetric channel (BSC) with crossover probability  $p = 0.1$ , undetected error probability is given by

- 0.1  
 0.01  
 0.02  
 0.001

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*0.02*

9) How many errors can this code correct ?

**1 point**

- 0  
 1  
 2  
 3

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*0*

10) How many errors can this code detect ?

1 point

- 0
- 1
- 2
- 3

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

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