X

Unit 4 - Week-3

Assignment -3

The due date for submitting this assignment has passed. **Due on 2016-04-05, 23:55 IST.**

Submitted assignment

1) Which of the following statements is incorrect *1 point*

- Turbo codes are parallel concatenated codes
- Turbo codes have very good BER/FER performance at high SNRs (signal-to-noise ratios)
- Turbo codes with recursive constituent encoders have good performance at low SNRs
- Good interleaver design helps in improving the distance spectrum of turbo codes

No, the answer is incorrect.
Score: 0

Accepted Answers:
Turbo codes have very good BER/FER performance at high SNRs (signal-to-noise ratios)

2) What is the feedforward inverse for the encoder with *1 point*

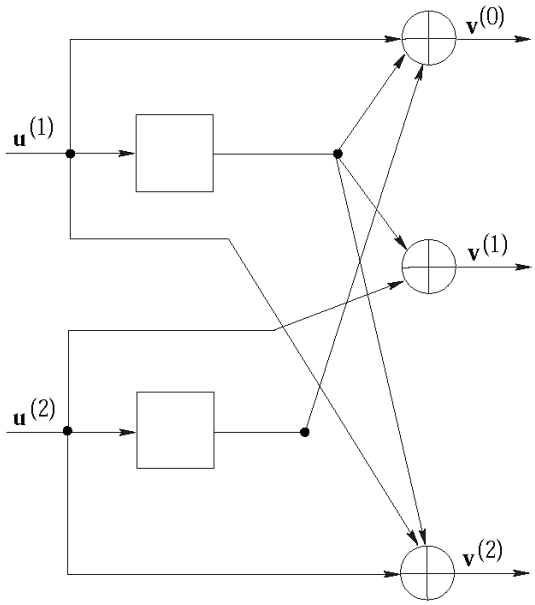
$$\mathbf{G}(D) = \begin{bmatrix} \frac{D^3+1}{D^3+D^2+1} & \frac{D^3+D+1}{D^3+D^2+1} \end{bmatrix}$$

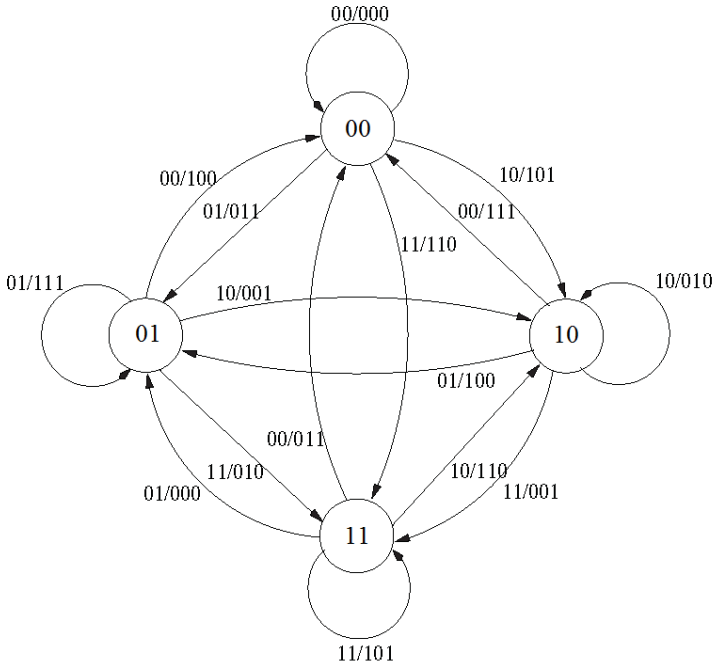
- $\begin{bmatrix} 1 \\ 0 \end{bmatrix}$
- $\begin{bmatrix} 1 \\ 1 \end{bmatrix}$
- $\begin{bmatrix} D+1 \\ D \end{bmatrix}$
- $\begin{bmatrix} D^2 \\ D^2+D+1 \end{bmatrix}$

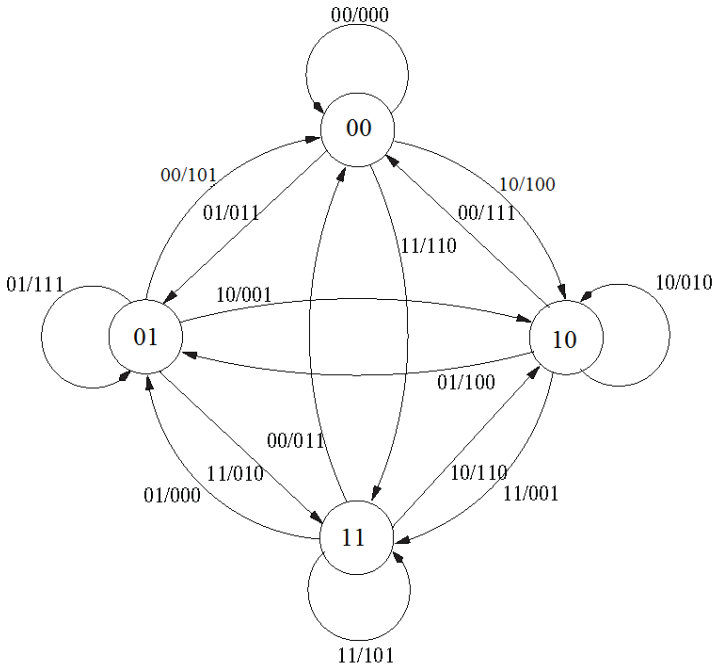
No, the answer is incorrect.
Score: 0

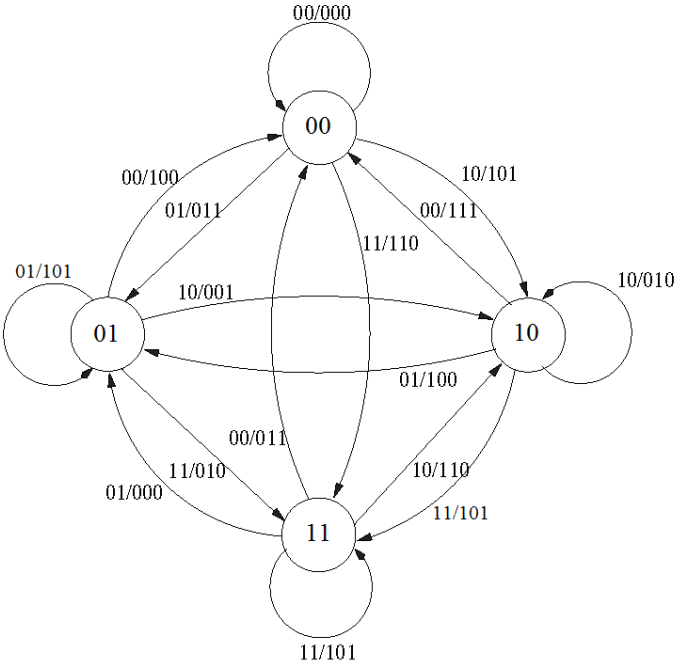
Accepted Answers:
$\begin{bmatrix} D+1 \\ D \end{bmatrix}$

3) What is the state diagram of the encoder given below **1 point**





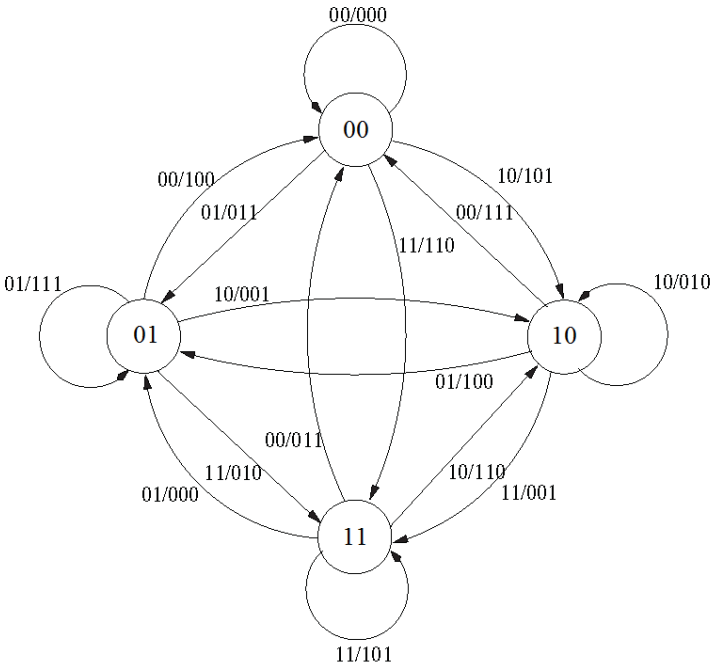




None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:



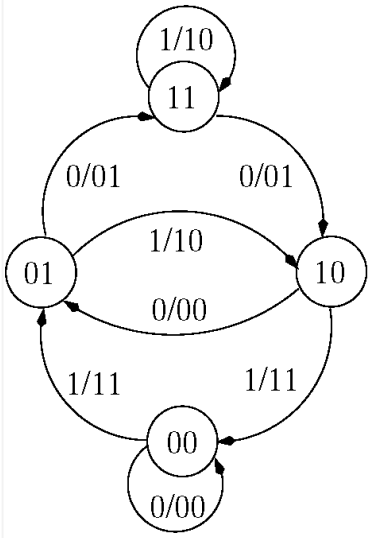
4) What is the free distance d_{free} of the convolutional encoder given in Question 3? ***1 point***

2
3
4
5

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

5) If the encoder given below is in state 01, what are the bits required to terminate it **1 point**



- 00
- 01
- 10
- 11

No, the answer is incorrect.
Score: 0

Accepted Answers:
11

6) Given below is a convolutional code with generator matrix $\mathbf{G(D)}$ which of the following cannot be realized:- **1 point**

- (a) $\begin{bmatrix} D & 1 & \frac{1+D}{D} \\ 1 & D & \frac{D}{1+D} \end{bmatrix}$
- (b) $\begin{bmatrix} D^2 & 1 & \frac{1+D}{1+D^2} \\ 1 & D^2 & \frac{D^2}{1+D} \end{bmatrix}$
- Both (a) & (b)
- Neither (a) nor (b)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(a) $\begin{bmatrix} D & 1 & \frac{1+D}{D} \\ 1 & D & \frac{D}{1+D} \end{bmatrix}$

7) For the (2,1,1) encoder with **G(D)**=[1 1+D] calculate the event error probability for crossover probability of for $p = 10^{-2}$binary symmetric channel. **1 point**

- $2 * 10^{-7}$
- $4 * 10^{-4}$
- $1.28 * 10^{-7}$
- $8 * 10^{-3}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$8 * 10^{-3}$

8) Calculate the bit error probability for the same encoder given in previous question for $p = 10^{-2}$ for binary symmetric channel *1 point*

- $4 * 10^{-5}$
- $8 * 10^{-5}$
- $8 * 10^{-3}$
- $1.28 * 10^{-7}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$8 * 10^{-3}$

9) Given a rate R=1/4, systematic serial concatenated code using rate R=1/2 repetition code as outer code and R=1/2 convolutional encoder with $\mathbf{G(D)} = \begin{bmatrix} 1 & \frac{1}{1+D} \end{bmatrix}$ as inner code, connected by an interleaver. For the above serial concatenated code of block-length, N=12, an interleaving pattern given by $\pi(i) = \{2, 4, 1, 5, 0, 3\}$ is used. What is the output of the interleaver corresponding to input sequence {1,0,1}. *1 point*

- {1 0 0 1 1 1}
- {1 1 0 0 1 1}
- {1 0 1 1 1 0}
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
{1 0 1 1 1 0}

10) Given a rate R=1/4, systematic serial concatenated code using rate R=1/2 repetition code as outer code and R=1/2 convolutional encoder with $\mathbf{G(D)} = \begin{bmatrix} 1 & \frac{1}{1+D} \end{bmatrix}$ as inner code, connected by an interleaver. For the above serial concatenated code of block-length, N=12, an interleaving pattern given by $\pi(i) = \{2, 4, 1, 5, 0, 3\}$ is used. What is the output coded sequence corresponding to input sequence {1,0,1}. *1 point*

- {1 0 1 1 1 1 0 1 1 0 0 0}
- {1 1 1 0 0 1 1 1 1 0 0 0}
- {1 1 0 1 1 0 1 1 1 0 0 0}
- none of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
{1 1 0 1 1 0 1 1 1 0 0 0}

Previous Page End