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Unit 3 - Week-2

Assignment-2

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

Submitted assignment

Assignment for Week-2

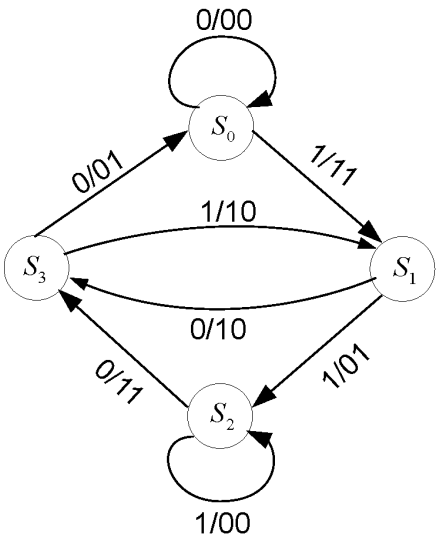
1) The number of states for rate $R = \frac{1}{2}$ convolution code with $\mathbf{G}(D) = \left[1 \quad \frac{1+D+D^2+D^3}{1+D^3}\right]$ is ***1 point***

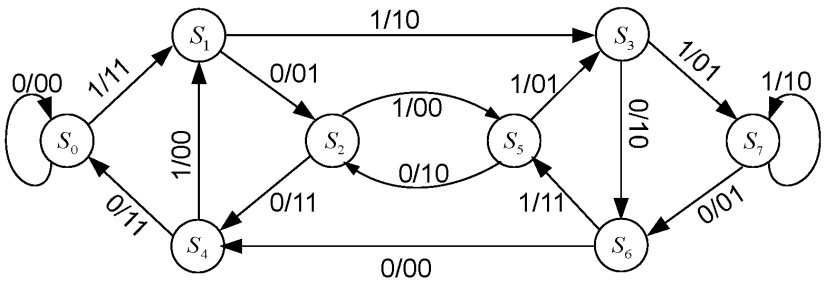
- 3
- 4
- 8
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

2) State diagram of convolutional encoders are shown below. Which of the following represents a catastrophic encoder ? ***1 point***

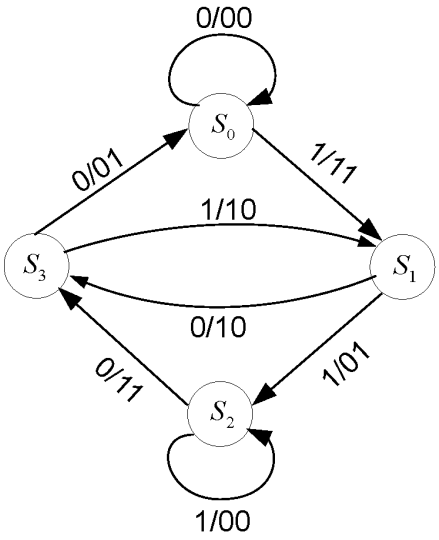




- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:



3) Given a rate $R = \frac{1}{n}$ convolutional code, which realization will always result in minimal encoder realization. ***1 point***

- Controller canonical form realization
- Observer canonical form realization
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Controller canonical form realization

4) Equivalent systematic generator matrix for rate $R = \frac{2}{3}$ convolution code with $\mathbf{G}(D) = \begin{bmatrix} 1 & 1 & 1+D \\ 0 & D & 1+D^2 \end{bmatrix}$ is ***1 point***

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

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\begin{bmatrix} 1 & 0 & \frac{1+D}{D} \\ 0 & 1 & \frac{1+D^2}{D} \end{bmatrix}$

5) ***1 point***

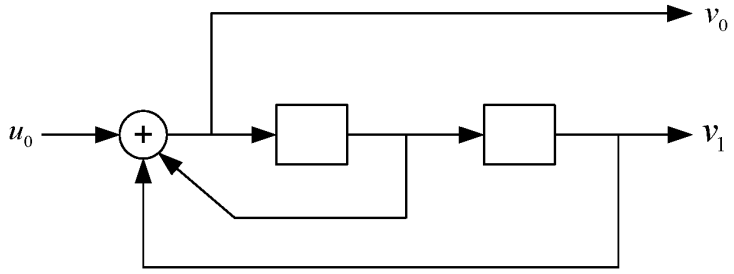
Equivalent systematic generator matrix of a rate $R = \frac{2}{3}$ convolutional encoder with $\mathbf{G}(D) = \begin{bmatrix} 1 & 1 & 1+D \\ 0 & D & 1+D^2 \end{bmatrix}$ can be realized using

- Controller canonical form realizer
- Observer canonical form realizer
- Both of the above
- Can not be realized

No, the answer is incorrect.
Score: 0

Accepted Answers:
Can not be realized

6) **1 point**



This is an example of

- Systematic feedback encoder
- Non-systematic feedback encoder
- Systematic feed forward encoder
- Non-systematic feed forward encoder

No, the answer is incorrect.
Score: 0

Accepted Answers:
Non-systematic feedback encoder

7) Weight enumerating function (WEF) of a (2,1,2) convolutional code with $\mathbf{G}(D) = \begin{bmatrix} 1 & 1+D^2 \end{bmatrix}$ is given by **1 point**

- $\frac{X^3-X^4+X^6}{1-2X+X^2-X^4}$
- $\frac{X^3+X^4-X^6}{1-2X-X^2-X^4}$
- $\frac{X^3+X^4-X^6}{1-2X-X^2+X^3}$
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{X^3-X^4+X^6}{1-2X+X^2-X^4}$

8) Input output weight enumeration function (IOWEF) of a (2,1,2) convolutional code with $\mathbf{G}(D) = \begin{bmatrix} 1 & 1+D^2 \end{bmatrix}$ is given by **1 point**

X: weight of k input bits
Y: weight of n coded bits
Z: label of each branch

- $\frac{XY^3Z^3+X^2Y^4Z^4+X^2Y^6Z^4}{1+XYZ^2+XYZ+X^2Y^4Z^3-X^2Y^2Z^3}$
- $\frac{XY^3Z^3+X^2Y^4Z^4-X^2Y^6Z^4}{1+XYZ^2-XYZ+X^2Y^4Z^3+X^2Y^2Z^3}$

- $\frac{XY^3Z^3-X^2Y^4Z^4+X^2Y^6Z^4}{1-XYZ^2-XYZ-X^2Y^4Z^3+X^2Y^2Z^3}$
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
$\frac{XY^3Z^3-X^2Y^4Z^4+X^2Y^6Z^4}{1-XYZ^2-XYZ-X^2Y^4Z^3+X^2Y^2Z^3}$

9) Decoding convolutional code using Viterbi algorithm will minimize ***1 point***

- Bit error rate for convolutional codes
- Frame error rate for convolutional codes
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Frame error rate for convolutional codes

10) BCJR algorithm will minimize ***1 point***

- Bit error rate for convolutional codes
- Frame error rate for convolutional codes
- Both of the above
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Bit error rate for convolutional codes

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