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NPTEL

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Courses » Information Theory, Coding and Cryptography

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Unit 11 - Week 10

Course outline

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Assignment 10

The due date for submitting this assignment has passed. **Due on 2018-10-10, 23:59 IST.**
As per our records you have not submitted this assignment.

1) For designing trellis code for AWGN channels, the emphasis must be on maximizing *1 point*

- Euclidean distance between code vectors
- Hamming distance between code vectors
- Manhattan distance between code vectors
- Shannon distance between code vectors

No, the answer is incorrect.
Score: 0

Accepted Answers:
Euclidean distance between code vectors

2) For designing trellis code for fading channels, the emphasis must be on maximizing *1 point*

- Euclidean distance between code vectors
- Effective length, L
- Minimum product distance $d_p^2(L)$
- None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
Effective length, L

3) The design rule for Space Time Trellis Codes for slow Rayleigh fading channel is given by *1 point*

- Rank-determinant criteria
- Product-distance criteria
- Maximum effective length criteria
- None of the above

No, the answer is incorrect.
Score: 0

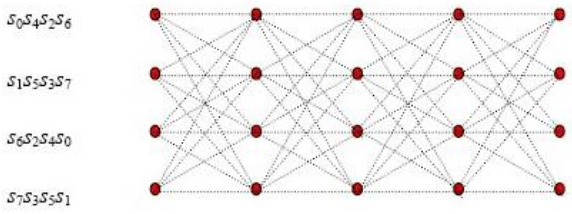
Accepted Answers:
Rank-determinant criteria

4) A 64-state TCM scheme has a d^2_{free}= 6.34Es. The asymptotic coding gain of this TCM scheme with respect to the uncoded minimum squared Euclidean distance of 2Es would be *1 point*

- 3 dB
- 4 dB

5 dB

5) Find the d^2_{free} for the TCM scheme shown below. ***1 point***



- d^2_{free}= (4 – √2) Es.
- d^2_{free}= 4Es.
- d^2_{free}= √2 Es.
- d^2_{free}= (4 + √2) Es.

No, the answer is incorrect.
Score: 0

Accepted Answers:
d^2_{free}= (4 – √2) Es.

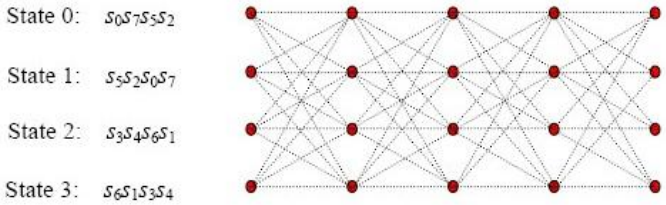
6) In the TCM scheme shown in the previous problem, the asymptotic coding gain is ***1 point***

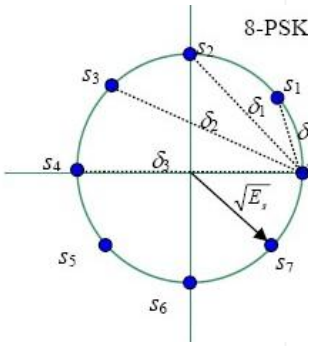
- 1.0 dB
- 1.1 dB
- 1.2 dB
- 1.3 dB

No, the answer is incorrect.
Score: 0

Accepted Answers:
1.1 dB

7) Consider the TCM scheme shown below. Suppose, the received vector is given by r = $s_7, s_5, s_1, s_3, s_1, s_6$ …. ***1 point***
Then, the transmitted sequence as determined by Viterbi decoding is



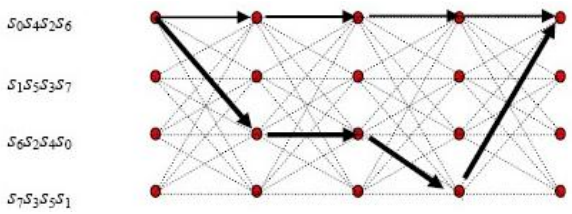


- $s_7, s_3, s_2, s_3, s_1, s_2$ …
- $s_1, s_4, s_5, s_3, s_1, s_6$ …
- $s_3, s_6, s_4, s_3, s_1, s_2$…
- $s_7, s_5, s_2, s_3, s_1, s_6$ …

No, the answer is incorrect.
Score: 0

Accepted Answers:
$s_7, s_5, s_2, s_3, s_1, s_6$ …

8) Suppose the all-zero path was transmitted using the TCM scheme shown below. The sequence of symbols representing the error event (denoted by bold lines) is ***1 point***

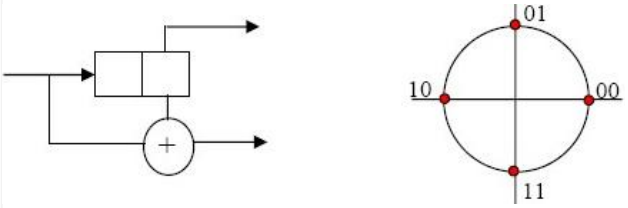


- $s_2, s_3, s_0, s_5, s_0, \ldots$
- $s_2, s_1, s_3, s_7, s_1, \ldots$
- $s_2, s_4, s_0, s_7, s_0, \ldots$
- $s_1, s_4, s_2, s_5, s_0, \ldots$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$s_2, s_4, s_0, s_7, s_0, \ldots$

9) For the TCM scheme shown below, the scalar transfer function, T(D), is given by ***1 point***

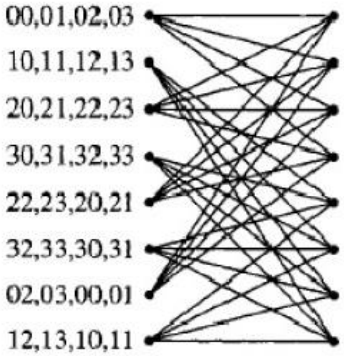


- $T(D) = D^3(1 - D + D^3) / (1 - 2D + D^2 + D^4)$
- $T(D) = D^3(1 - D + D^2) / (1 - D + D^2 + D^4)$
- $T(D) = D^2(1 - D^2 + D^3) / (1 - 2D + 2D^2 + D^3)$
- $T(D) = D(1 + D^2 + D^3) / (1 + 2D + D^2 + D^3)$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$T(D) = D^3(1 - D + D^3) / (1 - 2D + D^2 + D^4)$

10)What is the rate of the Space Time Trellis Code, using QPSK, shown below? ***1 point***



- 1/3
- 1/4
- 1/2
- 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

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