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NPTEL

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Courses » Information Theory, Coding and Cryptography

Announcements **Course** Ask a Question Progress Mentor FAQ

Unit 9 - Week 8

Course outline

- How to access the portal
- Week 1
- Week 2
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- Week 8
  - Introduction to BCH Codes: Generator Polynomials
  - Multiple Error Correcting BCH Codes, Decoding of BCH Codes
  - Introduction to Reed Solomon (RS) Codes
  - Quiz : Assignment 8
- Week 9

Assignment 8

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

Due on 2018-09-26, 23:59 IST.

1) Let α be the primitive element of GF(2^4). All the conjugates of α and the corresponding minimal polynomial are ***1 point***

- Conjugates: {α^1,α^2,α^4, α^8}, minimal polynomial = $x^4 + x + 1$
- Conjugates: {α^1,α^2,α^4, α^8}, minimal polynomial = $x^4 + x^3 + 1$
- Conjugates: {α^1,α^3,α^6, α^{12}}, minimal polynomial = $x^4 + x + 1$
- Conjugates: {α^1,α^4,α^8, α^{12}}, minimal polynomial = $x^4 + x^3 + 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
Conjugates: {α^1,α^2,α^4, α^8}, minimal polynomial = $x^4 + x + 1$

2) Let α be the primitive element of GF(2^6). If $\beta = \alpha^7$, the value of β^9 will be ***1 point***

- α^3
- α^7
- α^9
- 1

No, the answer is incorrect.
Score: 0

Accepted Answers:
1

3) The square root of the element α^5 in GF(2^3) is (i.e., find y where $y^2 = \alpha^5$) ***1 point***

- α^2
- α^6

Additional Lectures

α^6

4) The generator polynomial g(x) for a double error correcting ternary BCH code of block length 8 is **1 point**

- $g(x) = x^5 + x^4 + 2x^3 + x^2 + 1$
- $g(x) = x^5 + 2x^4 + x^3 + 2x^2 + 2$
- $g(x) = x^5 + x^4 + 2x^2 + 1$
- $g(x) = x^5 + 2x^4 + x^3 + x^2 + 2$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(x) = x^5 + 2x^4 + x^3 + x^2 + 2$

5) Let the primitive block length n = 31 with q = 2, and m = 5. The generator polynomial for a single error correcting BCH code will be **1 point**

- $g(x)= x^5 + x^2 + 1$
- $g(x)= x^5 + x^4 + 1$
- $g(x) = x^5 + x + 1$
- $g(x) = x^4 + x + 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(x) = x^5 + x + 1$

6) For a binary BCH code with n = 31 the generator polynomial for a triple error correcting code will be **1 point**

- $g(x) = x^{15} + x^{13} + x^{11} + x^9 + x^8 + x^7 + x^5 + x^4 + x^2 + x + 1$
- $g(x) = x^{15} + x^{11} + x^{10} + x^9 + x^8 + x^7 + x^5 + x^3 + x^2 + x + 1$
- $g(x) = x^{14} + x^{11} + x^{10} + x^9 + x^7 + x^6 + x^5 + x^3 + x^2 + x + 1$
- $g(x) = x^{15} + x^8 + x^7 + x^5 + x^3 + x^2 + x + 1$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(x) = x^{15} + x^{11} + x^{10} + x^9 + x^8 + x^7 + x^5 + x^3 + x^2 + x + 1$

7) RS code satisfies **1 point**

- $n + k = 2t$
- $n – k = t$
- $n – k = 2t$
- $n + k = t$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$n – k = 2t$

8) The generator polynomial for the triple error correcting RS code of block length 15 over GF(16) is **1 point**

- $g(x) = x^6 + \alpha^3x^5 + \alpha^4x^4 + \alpha^2x^3 + \alpha^6x^2 + \alpha^9x + \alpha^2$

- $g(x) = x^6 + \alpha^{10}x^5 + \alpha^5x^4 + \alpha^4x^3 + \alpha^3x^2 + \alpha^9x + \alpha^4$
- $g(x) = x^6 + \alpha^6x^5 + \alpha^{10}x^4 + \alpha^4x^3 + \alpha x^2 + \alpha^3x + \alpha^9$
- $g(x) = x^6 + \alpha^{10}x^5 + \alpha^{14}x^4 + \alpha^4x^3 + \alpha^6x^2 + \alpha^9x + \alpha^6$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$g(x) = x^6 + \alpha^{10}x^5 + \alpha^{14}x^4 + \alpha^4x^3 + \alpha^6x^2 + \alpha^9x + \alpha^6$

9) Find the block length, n, of an RS code that has k = t ***1 point***

- n = 7
- n = 15
- n = 31
- n = 63

No, the answer is incorrect.
Score: 0

Accepted Answers:
n = 15

10) The minimum distance for the RS (31, 21) code is ***1 point***

- 9
- 10
- 11
- 12

No, the answer is incorrect.
Score: 0

Accepted Answers:
11

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