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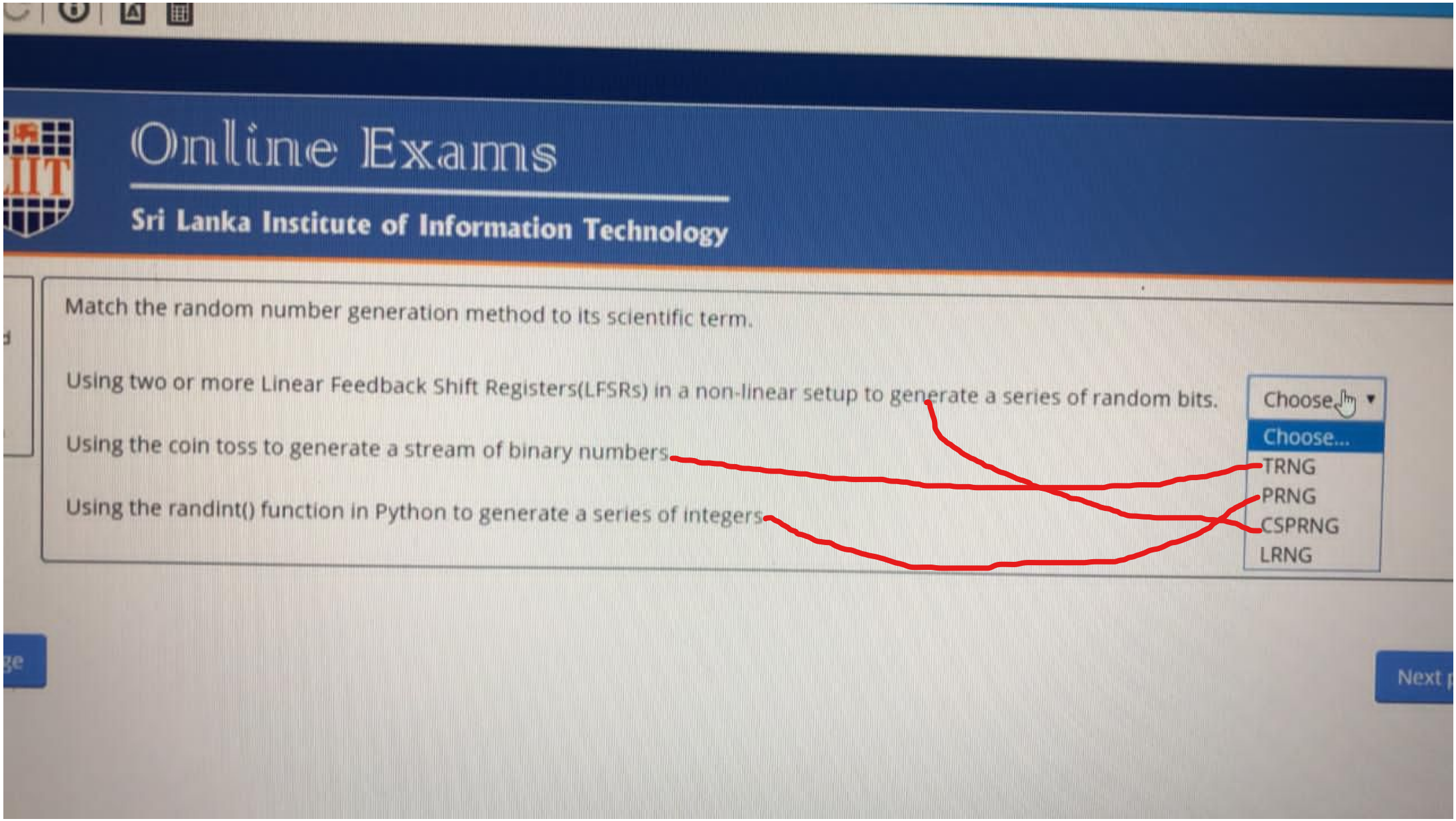
Using extended Euclidean algorithm calculate the multiplicative inverse of 7 mod 26.

Answer: 15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Match the random number generation method to its scientific term.
Using two or more Linear Feedback Shift Registers(LFSRs) in a non-linear setup to generate a series of random bits.
Choose...
Using the coin toss to generate a stream of binary numbers
Using the randint() function in Python to generate a series of integers
Choose...
TRNG
PRNG
CSPRNG
LRNG

Which of the following is an incorrect statement regarding Advance Encryption Standard (AES) ?

Select one:

- a. AES was chosen by the NIST in a multi-year selection process
- b. AES supports three key lengths
- c. AES is resistant to brute force attacks for the foreseeable future
- d. AES is the world standard for block encryption
- e. AES has a known weakness against differential cryptanalysis

page

Question 2

Not yet answered

Marked out of 1.00

Flag question

ORIGINAL PICTURE

ENCRYPTED PICTURE

John has encrypted an image using a block cipher. Which mode was used to encrypt the image?

Select one:

- a. Counter Mode
- b. Cipher Block Chaining Mode
- c. Electronic Code Book Mode
- d. Cipher Feedback Mode
- e. Output Feedback Mode

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In Output Feedback Mode (OFB) receiver does not have to use the block cipher decryption function.

Select one:

- True
- False

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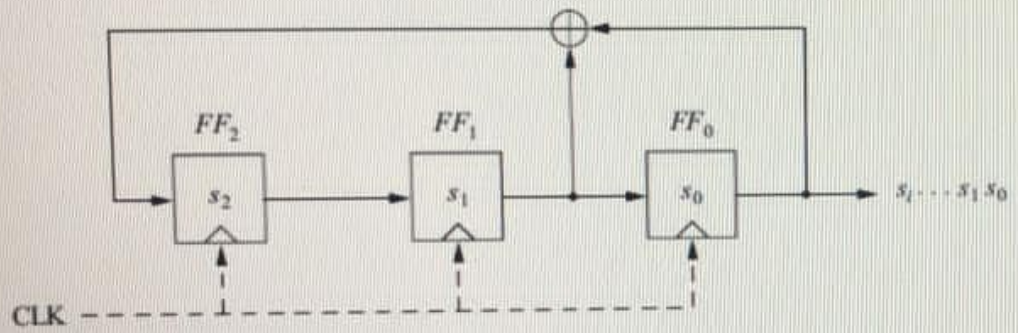
What is the correct mathematical description of the given LFSR below?



Select one:

a. $X^3 + X + 1$

b. $X^4 + X^2 + 1$

c. $X^4 + X + 1$

d. $X^3 + X^2 + X + 1$

e. All given answers are inaccurate

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question

What is the complexity of brute-forcing substitution cipher for the English alphabet?

Select one:

- a. 26 x 25
- b. 25
- c. 26!
- d. 26^{26}
- e. 26^{2}

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Match the correct Encryption standard to the description.

Has an input block size of 64bits and an effective key length of 112bits — Triple Data Encryption Standard (3DES)

Previously called Rijndael, eventually chosen as the world standard for block encryption — Advanced Encryption Standard (AES)

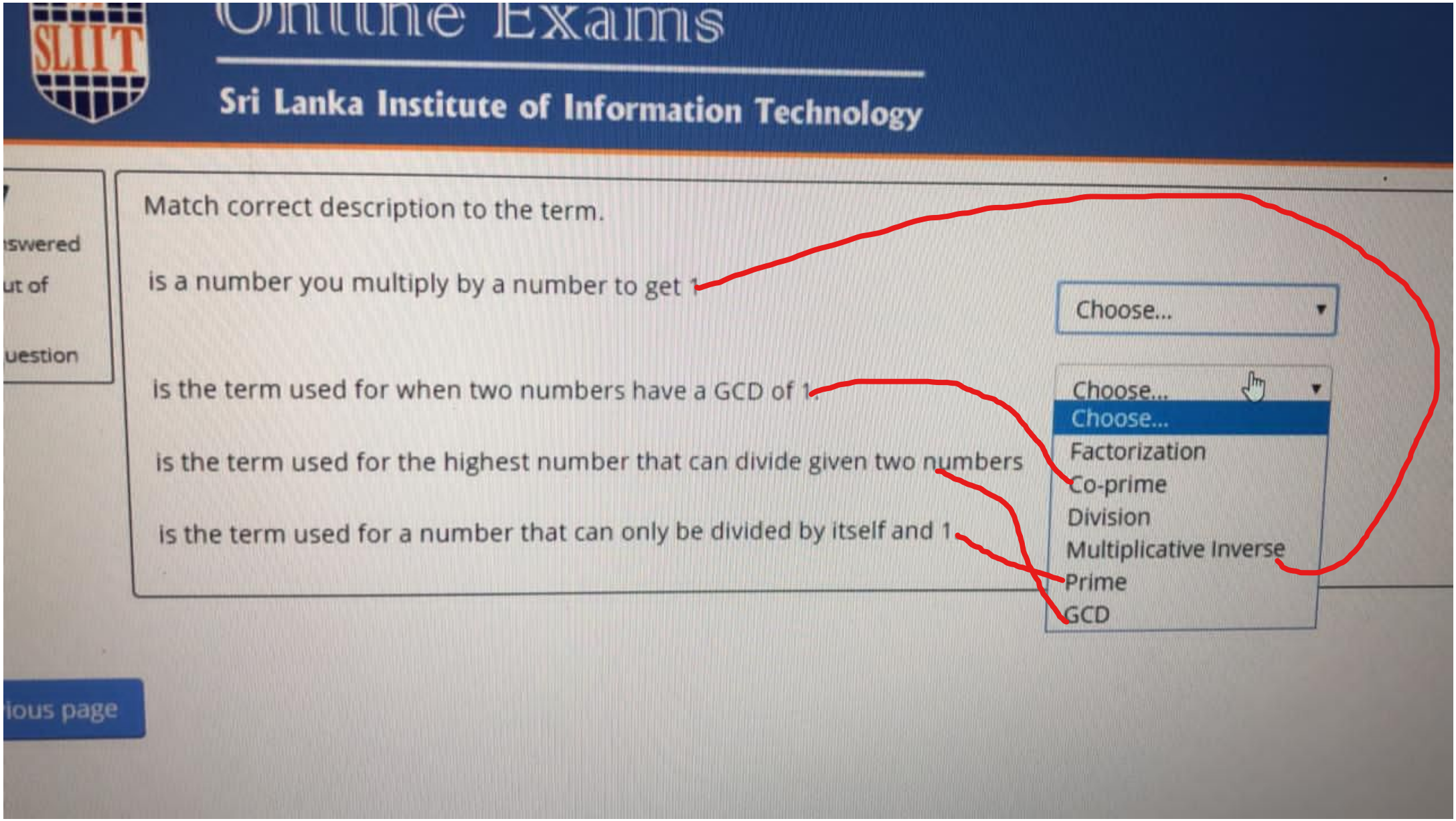
No longer used, has an input block size of 64bits and an effective key legth of 56bits — Data Encryption Standard (DES)

One of the candidate algorithms developed by IBM which was selected as a finalist in a worldwide competition. — Mars

Choose...

Choose...
Data Encryption Standard (DES)
Triple Data Encryption Standard (3DES)
Serpent
Advanced Encryption Standard (AES)
Mars
TwoFish

Next page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Match correct description to the term.
is a number you multiply by a number to get 1
Choose...
is the term used for when two numbers have a GCD of 1
Choose...
is the term used for the highest number that can divide given two numbers
is the term used for a number that can only be divided by itself and 1
Choose...
Factorization
Co-prime
Division
Multiplicative Inverse
Prime
GCD

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What is the maximum length of random bits can be achieved with a Linear Feedback Shift Register (LFSR) with 8 registers?

Answer: 127

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what is the correct statement regarding 'Confusion' property in block cipher?

Select one:

- a. An operation where the relationship between plain-text and cipher-text is obscured
- b. None of the above
- c. An operation where the relationship between key and cipher-text is obscured
- d. An operation where relationship between key and plain-text is obscured
- e. An operation where the relationship between key and encryption algorithm is obscured

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In symmetric encryption the problem of secure communication is reduced to secure transmission and storage of the key.

Select one:

- True
- False

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Which of the following is not accurate regarding Random Number Generation.

Select one:

- a. PRNGs have bad cryptographic properties
- b. Coin toss can be used as a True Random Number Generation (TRNG) method
- c. Since TRNG cannot be reproduced, they cannot be used in cryptography
- d. Pseudo random number generators (PRNG) are ideal to built crypto systems

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Find the multiplicative inverse (a^{-1}) of a mod m, where $a * a^{-1} = 1 \bmod m$

- a = 17, m = 673

Answer: 198

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3

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Which of the following is not an example for 'Diffusion' property in block cipher?

Select one:

- a. DES Permutation
- b. DES S-Box
- c. DES Expansion Box
- d. AES Mix Column Layer
- e. AES Shift Row Layer

ous page

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Which of the following statements is an accurate definition of a 'Brute Force Attack' against an encryption algorithm?

Select one:

- a. An attacker systematically attempts all possible keys.
- b. An attacker first analyses a set of possible keys and then try the rest of the keys.
- c. An attacker analyse the cipher texts to derive few possible keys.
- d. An attacker systematically attempts selected set of keys.
- e. An attacker analyse known plain texts to derive few possible keys.

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-14 mod 6

Answer: 4

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What is the maximum length of random bits can be achieved with a Linear Feedback Shift Register (LFSR) with 11 registers?

Answer: 2047

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Which of the following is an accurate statement regarding Kerckoff's Principle?

Select one:

- a. A cryptosystem should be secure even if the attacker knows all details about the system, with the exception of the decryption algorithm.
- b. A cryptosystem should be secure even if the attacker knows all details about the system, with the exception of the encryption algorithm.
- c. A cryptosystem should be secure even if the attacker knows all details about the system, with the exception of both encryption and decryption algorithms.
- d. A cryptosystem should be secure even if the attacker knows all details about the system, with the exception of the secret key.
- e. All given answers are inaccurate

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What is the correct statement regarding non-linearity of NLFSR such as Trivium?

Select one:

- a. Non-linearity is achieved using an initialization vector
- b. Non-linearity is achieved using extra number of X-OR Gates
- c. Non-linearity is achieved using pseudo random seed values
- d. Non-linearity is achieved using multiple LFSRs connected in parallel with AND Gates
- e. Non-linearity is achieved using extra number of registers

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question

Which of the following is not a correct equation for decryption?

Select one:

a. $e^{-1}_k(x)$

b. $d_k(e_k(x))$

c. $e^{-1}_k(y)$

d. All are correct

e. $d_k(y)$

Which of the following mode has the fastest encryption implementation?

Select one:

- a. Cipher Block Chaining mode(CBC)
- b. Cipher Feedback mode(CFB)
- c. Counter mode(CTR)
- d. Block mode(BM)
- e. Output Feedback mode(OFB)

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In Affine cipher, the key consists of two parts k = (a,b). Which of the following is a suitable 'a,b' pair? Affine cipher encryption and decryption is given below

Let k, x, y ε {0,1, …, 25}

- Encryption: $y = e_K(x) \equiv a\,x + b \bmod 26$
- Decryption: $x = d_K(x) \equiv a^{-1}(y - b) \bmod 26$

Select one:

- a. a = 13, b = 7
- b. a = 8, b = 9
- c. a = 4, b = 15
- d. a = 11, b = 3
- e. None of the above

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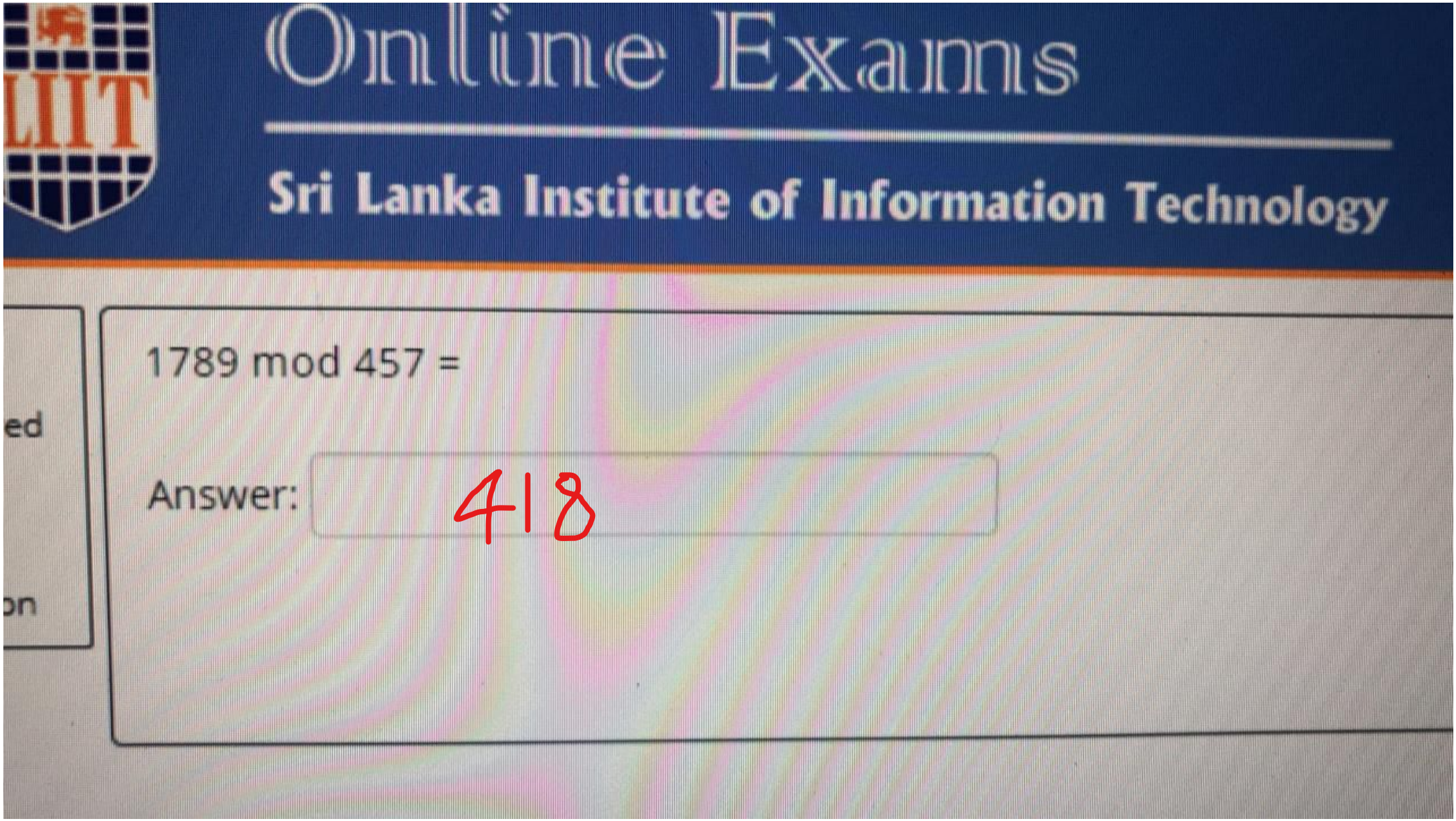
Which of the following is not a reason to use X-OR as an encryption function in stream ciphers?

Select one:

- a. Ease of implementation
- b. Encryption and Decryption both achieved by the same function
- c. Ability to use in an asynchronous setup
- d. Efficiency
- e. 50% chance of output being '1' or '0'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1789 mod 457 =
Answer:
418

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Initialization Vector (IV) is a secret value used to start the block encryption mechanism in Cipher Block Chaining mode.

Select one:

- True
- False