**Computer Security – IV1013**

**Quiz 1**

1, Compute the multiplicative inverse of 5 in **Z**21.

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2, Eve has an antenna that can pick up Alice’s encrypted cell phone conversations. What type of attack is Eve employing?

Ciphertext-only attack ?

3, What is 716 mod 11?

4

4,

6, 9, 7

5, Why can’t Bob use the pair (1,*n*) as an RSA public key, even if *n*=*pq*, for two large primes, *p* and *q*?

1 doesn’t encrypt

6,

7 254 329

7, Assume that the Hill cipher matrix *K* is

CAT = 2 0 19 Cipher = 24 17 19

8, What is 7120 mod 143?

1

9,

Sub for 12 = 7

Sub for 7 = 11

Sub for 2 = 15

10,

11,

12,

13,

128 = 3.40E38

192 = 6.28E57

256 = 1.16E77

14, What is the encryption of the string THELAZYFOX using the Caesar cipher (with three shift steps)?

WKHODCBIRA

15, Show the result of an Elgamal encryption of the message *M*=8 using *k*=4 for the public key (*p*,*g*,*y*)=(59,2,25):

(16, 6)

16,

An attacker has an encrypted message and knows the plain text is in ASCII-form. The attacker is aware of the encryption algorithm and that the key is 128 bit long. In a brute-force attack, what is the minimum number of characters of the plain-text in order to be able to find the secret key?

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17,

Explain why non-forgeability and non-mutability imply non-deniability for digital signatures.

Non-mutability implies non-repudiation which makes  it very difficult to successfully deny who/where a message came from as well as the authenticity and integrity of that message. Non-mutability means that it’s not possible to reuse a signature from a previous message.

Non-forgeability means it’s not possible to counterfeit a signature. I.e. only the valid user can sign with the valid signature.

If both non-mutability and non-forgeability holds the signature cannot be denied.

Non-forgeability and non-mutability imply non-deniability because if it’s impossible to counterfeit your signature and at the same time it’s not possible to use a previously used signature then it must be the valid user. I.e. you cannot deny that you have signed.

18,

Explain the strengths and weaknesses of using symmetric encryption, like AES, versus a public-key cryptosystem, like RSA.