

ISO/IEC 18033-2:2006-05 (E)

Information technology - Security techniques - Encryption algorithms - Part 2: Asymmetric ciphers

Contents		Page
1	Scope	1
2	Normative references	1
3	Definitions	2
4	Symbols and notation	7
5	Mathematical conventions	8
5.1	Functions and algorithms	8
5.2	Bit strings and octet strings	9
5.3	Finite Fields	10
5.4	Elliptic curves	12
6	14
6.1	Cryptographic hash functions	14
6.2	Key derivation functions	15
6.3	MAC algorithms	16
6.4	Block ciphers	16
6.5	Symmetric ciphers	17
7	Asymmetric ciphers	19
7.1	Plaintext length	20
7.2	The use of labels	21
7.3	Ciphertext format	21
7.4	Encryption options	21
7.5	Method of operation of an asymmetric cipher	22
7.6	Allowable asymmetric ciphers	22
8	Generic hybrid ciphers	22
8.1	Key encapsulation mechanisms	23
8.2	Data encapsulation mechanisms	24
8.3	HC	25
9	Constructions of data encapsulation mechanisms	26
9.1	DEM1	26
9.2	DEM2	27
9.3	DEM3	28
10	EIGamal-based key encapsulation mechanisms	30
10.1	Concrete groups	30
10.2	ECIES-KEM	32
10.3	PSEC-KEM	34
10.4	ACE-KEM	36
11	RSA-based asymmetric ciphers and key encapsulation mechanisms	39
11.1	RSA key generation algorithms	39
11.2	RSA Transform	40
11.3	RSA encoding mechanisms	40
11.4	RSAES	42
11.5	RSA-KEM	44

12	Ciphers based on modular squaring	45
	Cryptographic transformations 12.1 HIME key generation algorithms	45
12.2	HIME encoding mechanisms	46
12.3	HIME(R)	48
	Annex A (normative) ASN.1 syntax for object identifiers	51
	Annex B (informative) Security considerations	61
B.1	MAC algorithms	61
B.2	Block ciphers	62
B.3	Symmetric ciphers	62
B.4	Asymmetric ciphers	63
B.5	Key encapsulation mechanisms	65
B.6	Data encapsulation mechanisms	66
B.7	Security of HC	68
B.8	Intractability assumptions related to concrete groups	68
B.9	Security of ECIES-KEM	69
B.10	Security of PSEC-KEM	71
B.11	Security of ACE-KEM	71
B.12	The RSA inversion problem	72
B.13	Security of RSAES	73
B.14	Security of RSA-KEM	73
B.15	Security of HIME(R)	74
	Annex C (informative) Test vectors	75
C.1	Test vectors for DEM1	75
C.2	Test vectors for ECIES-KEM	76
C.3	Test vectors for PSEC-KEM	83
C.4	Test vectors for ACE-KEM	91
C.5	Test vectors for RSAES	100
C.6	Test vectors for RSA-KEM	105
C.7	Test vectors for HC	109
C.8	Test vectors for HIME(R)	112
	Bibliography	123