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Reg. No. : | | | | | | | | | | |

Question Paper Code: 96202

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Sixth Semester

Computer science and Engineering

19UCS602- CRYPTOGRAPHY AND NETWORK SECURITY

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. A symmetric cipher system has an IC of 0.041. What is the length of the key 'm'? CO1- U

   (a) 1 (b) 3 (c) 2 (d) 5

2. The number of tests required to break the DES algorithm are CO2- U

   (a) 2.8×1014 (b) 4.2×109 (c) 1.84×1019 (d) 7.2×1016

3. What is the output of the N 1024-bit blocks from the Nth stage in this? CO3- U

   (a) 512 bits (b) 1024 bits (c) N x 1024bits (d) N x 512 bits

4. Extensions were added in which version? CO1- U

   (a) 1 (b) 2 (c) 3 (d) 4

5. In _____, there can be multiple paths from fully or partially trusted authorities. CO1- U

   (a) X509 (b) PGP (c) KDC (d) none of the above

PART – B (5 x 3= 15Marks)

6. Define Model of network security CO1- U

7. Assume that a = 255 and n = 11. We can find q = 23 and r = 2 using the division algorithm we have learned in arithmetic. Calculate q and r for a= -255 and n=11 CO2- App

8. Using the properties of discrete logarithms, show how to solve the following congruence: $x^2 \equiv 36 \pmod{77}$. CO2- App

9.		Design the role of Ticket Granting Server in inters realm operations of Kerberos.	CO2- App	
10.		Does the firewall ensure 100% security to the system? Comment	CO4- Ana	

PART – C (5 x 16= 80Marks)

11.	(a)	Compare transposition cipher and substitution cipher. Apply two stage transpositions Cipher on the "treat diagrams as single units" using the keyword "sequence".	CO2-App	(16)
		Or		
	(b)	Illustrate the rules to perform encryption using play fair cipher and encrypt 'snow shooos' using 'monarchy' I and J count as one letter and x is the filler letter.	CO2-App	(16)
12.	(a)	Describe AES algorithm with all its round functions in detail.	CO1-U	(16)
		Or		
	(b)	Describe DES algorithm with neat diagram and explain the steps.	CO1-U	(16)
13.	(a)	Examine Elliptic Curve Cryptography Simulating ElGamal.	CO4-Ana	(16)
		Or		
	(b)	Users A and B use the Diffie-Hellman key exchange technique, a common prime q=11 and a primitive root alpha=7. (i) If user A has private key XA=3.What is A's public key YA? (ii) If user B has private key XB=6. What is B's public key YB? (iii) What is the shared secret key? Also write the algorithm.	CO4-Ana	(16)
14.	(a)	Describe Challenge-Response protocols in detail.	CO1- U	(16)
		Or		
	(b)	Design the steps involved in Signature generation and Verification functions of DSS.	CO1- U	(16)
15.	(a)	Explain the working principle of SET relate EST for Ecommerce applications	CO1-U	(16)
		Or		
	(b)	Describe PGP cryptographic functions in detail with suitable block diagrams.	CO1-U	(16)