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BTECH
(SEM VII) THEORY EXAMINATION 2023-24
CRYPTOGRAPHY AND NETWORK SECURITY

TIME: 3 HRS**M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A**1. Attempt all questions in brief.****2 x 10 = 20**

Q no.	Question	Marks
a.	Define steganography with example.	2
b.	Explain cryptanalysis.	2
c.	Compute GCD (24120,1640) using Euclid's algorithm.	2
d.	Find all primitive roots of 13.	2
e.	Explain birthday attack.	2
f.	Write the services provided by digital signature.	2
g.	Define X.509 certificates.	2
h.	List the any four services provided by Pretty good privacy.	2
i.	Discuss intrusion detection.	2
j.	Explain firewall and its usage.	2

SECTION B**2. Attempt any three of the following:**

a.	Discuss the working of DES in detail with suitable diagram.	10
b.	Explain RSA algorithm with suitable steps. Let $p=17$, $q=11$, $e=7$ and $d=23$. Calculate the public key & private key and show encryption and decryption for plain text $M=77$ by using RSA algorithm.	10
c.	Explain Digital Signature. Discuss signing & verifying process of Digital Signature Algorithm (DSA) in detail with suitable steps.	10
d.	Discuss Diffie-Hellman key exchange in detail with suitable diagram.	10
e.	Explain secure electronic transaction (SET) protocol with suitable diagram.	10

SECTION C**3. Attempt any one part of the following:****10 x 3 = 30**

a.	Discuss cryptography and its types with suitable example.	10
b.	Define block cipher. Also discuss any two block cipher modes of operation with advantages and disadvantages of each with block diagram.	10

4. Attempt any one part of the following:**10 x 1 = 10**

a.	State and prove Fermat's theorem. Use Fermat theorem to find a number 'a' between 0 and 72 with $a \equiv 9794 \pmod{73}$.	10
b.	State Chinese remainder theorem (CRT). Solve the following congruent equations by CRT i. $X \equiv 2 \pmod{3}$ ii. $X \equiv 3 \pmod{5}$	10



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TIME: 3 HRS**M.MARKS: 100****5. Attempt any *one* part of the following:****10 x 1= 10**

a.	Discuss message authentication code (MAC).Also give the use of authentication requirement in MAC.	10
b.	Explain Hash Function. Discuss SHA- 512 with all required steps, round function with block diagram.	10

6. Attempt any *one* part of the following:**10 x 1= 10**

a.	Explain Kerberos protocol for key distribution with suitable diagram.	10
b.	Discuss X.509 certificates in detail. Write the role of X.509 certificates in cryptography.	10

7. Attempt any *one* part of the following:**10 x 1= 10**

a.	Discuss authentication header and encapsulating security payload in detail with packet format.	10
b.	Explain working of intrusion detection system (IDS) and its types with suitable diagram.	10