


Name:			
Enrolment No:			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, December 2022</b>			
<b>Course: B Tech</b> <b>Program: CSE (All IBM + Xebia)</b> <b>Course Code: CSEG4001</b>		<b>Semester: VII</b> <b>Time : 03 hrs.</b> <b>Max. Marks: 100</b>	
<b>Instructions: Answer all the Questions</b>			
<b>SECTION A</b>			
S. No.		Marks	CO
Q 1	What is the difference between a monoalphabetic cipher and a polyalphabetic cipher?	4	CO1
Q 2	What entities constitute a full-service Kerberos environment?	4	CO3
Q 3	What is the difference between weak and strong collision resistance?	4	CO2
Q 4	What is the difference between direct and arbitrated digital signatures?	4	CO3
Q 5	What is the sum of three points on an elliptic curve that lie on a straight line?	4	CO2
<b>SECTION B</b>			
Q 6	Differentiate between symmetric and asymmetric cipher. Encrypt the plaintext using this Play fair cipher having key "Sunil" and message is: "cryptography is a secret writing".	10	CO1
Q 7	List four techniques used by firewalls to control access and enforce a security policy.	10	CO4
Q 8	What are the different services provided by IPsec? How AH and ESP are used in the architecture of IPsec.	10	CO3
Q 9	Decipher the message YITJP GWJOW FAQTQ XCSMA ETSQU SQAPU SQGKC PQTYJ using the Hill cipher with the inverse key= $\begin{pmatrix} 5 & 1 \\ 2 & 7 \end{pmatrix}$ . Show your calculations and the result.  <b>OR</b> Encrypt the message "meet me at the usual place at ten rather than eight oclock" using the Hill cipher with the key= $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$ . Show your calculations and the result.	10	CO1
<b>SECTION-C</b>			

Q 10	<p>Why do we use public key cryptography? Describe the role of the RSA algorithm and perform encryption and decryption using the RSA algorithm for the following:</p> <p>(a) <math>p = 3, q = 11, e = 7, M = 5</math>  (b) <math>p = 11, q = 13, e = 11, M = 7</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Explain public key management in cryptography. Whether Diffie-Hellman supports in public key management, also solve the following example and show your calculations and the result:</p> <p>Alice and Bob use the Diffie-Hellman key exchange technique with a common prime <math>q = 23</math> and a primitive root <math>\alpha = 5</math>.</p> <p>a. If Bob has a public key <math>Y_B = 10</math>, what is Bob's private key <math>Y_B</math>?  b. If Alice has a public key <math>Y_A = 8</math>, what is the shared key <math>K</math> with Bob?  c. Show that 5 is a primitive root of 23.</p>	<b>20</b>	<b>CO2</b>
Q 11	<p>Explain the following:</p> <p>a) Intrusion Detection System  b) Trusted Systems  c) Zero Knowledge Protocol  d) Biometric Authentication</p>	<b>20</b>	<b>CO4</b>