Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET – B

SCHOOL OF ENGINEERING
END TERM EXAMINATION – MAY/JUNE 2024

Semester : Semester VI - 2021
Course Code : CSE3094
Course Name : Cyber Security

Date : June 10, 2024
Time : 01.00pm to 04.00pm
Max Marks :100

Program : B.Tech. Computer Science and Engineering

Weightage : 50%

Note: 1. Answer ALL 5 FULL Questions.
2. Each Full Question carries 20 Marks
3. Scientific and non-programmable calculator are permitted.
4. Do not write any information on the question paper other than Roll Number.

1.a.	Bring out the Differences between Information Security and Network Security **[Knowledge]**	**(CO1)**	**(04 Marks)**
1.b.	Mr. Alex and Mr.Ram are two people who used to chat using each other on one fine day Mr.Alex Sends a "Hello" message to Mr.Ram but Mr.Ram receives "Where are you ". In this Scenario which type of attack has taken place? Explain about the attack **[Comprehension]**	**(CO1)**	**(06 Marks)**
1.c.	Losing account information, computer, or other personal information can be very harmful; because this information can be used by an unauthorized person for any illegal activity. What defense mechanisms can you use to overcome from this? Explain in detail **[Application]**	**(CO1)**	**(10 Marks)**

or

2.a.	Explain the different attacks when the following security objective breaches 1. Threat to confidentiality 2. Threat to integrity 3. Threat to availability **[Knowledge]**	**(CO1)**	**(04 Marks)**
2.b.	A new security manager has detected some vulnerabilities in his company i.e. its internal network has been breached, and sensitive data is being transmitted to an external source. Identify two security services that have been compromised in this scenario, and briefly explain how they could have protected the data if implemented properly **[Comprehension]**	**(CO1)**	**(06 Marks)**

2.c.	A security agency responsible for national security is seeking to strengthen its cybersecurity posture to defend against evolving cyber threats. Outline three essential security services that the agency should prioritize to safeguard sensitive information and critical infrastructure. Discuss how each security service contributes to confidentiality, integrity, availability, and accountability in ensuring national security interests **[Application]**	**(CO1)**	**(10 Marks)**
3.a.	Explain how an attacker attacks on packet sequence.? Explain with an example **[Knowledge]**	**(CO2)**	**(04 Marks)**
3.b.	Assume that you are the manager for a company called 'XYZ'. One day employees report issues accessing the company's official website. They didn't connect to actual website instead employees are being redirected to a website that looks nearly identical investigate what security threat occurred and explain it **[Comprehension]**	**(CO2)**	**(06 Marks)**
3.c.	There are different Unintentional /Non-malicious Programming oversights. List them all and explain anyone in detail **[Application]**	**(CO2)**	**(10 Marks)**
	or		
4.a.	An attacker can easily exploit the use Exploiting Known Vulnerabilities" to attack a service/data? Explain **[Knowledge]**	**(CO2)**	**(04 Marks)**
4.b.	A company xyz has hired a new software trainee who has been appointed as junior software engineer was asked to develop a product. While developing a code for the same he did not takeoff array overflow inputs. How will this lead to non-malicious program attack/flaw. Explain the type of attack in detail **[Comprehension]**	**(CO2)**	**(06 Marks)**
4.c.	ALOK is accessing her online banking account from a Coffee shop using public Wi-Fi. Meanwhile, Mallory, a malicious attacker, sets up a fake Wi-Fi hotspot nearby. Mallory intercepts the Communication between ALOK and the legitimate banking server posing as the server to ALOK& Vice Versa. Mallory can now intercept Sensitive information such as login credentials and transactions details without either party Knowing. Identify the type of the attack involved in this scenario and explain the steps involved also suggest preventive measures for the same **[Application]**	**(CO2)**	**(10 Marks)**
5.a.	When two communicating parties need to use two keys, then which type of encryption system should be used? Explain the same with a neat block diagram **[Knowledge]**	**(CO3)**	**(04 Marks)**
5.b.	Alice sends a message to Bob. Message or the plain text is - HELLO. How do you encrypt this message using One Time Pad cipher if the key given is XMCKL? Also show the decryption process **[Comprehension]**	**(CO3)**	**(06 Marks)**

5.c.	You are a cybersecurity specialist working for a government agency. Your agency needs to securely transmit top-secret documents to a foreign diplomat stationed overseas. You decide to use RSA encryption to ensure the confidentiality of the documents during transmission. *The IT department provides you with the following information: * * Two large prime numbers: p = 7 and q = 17 * Public key (e) = 5 *Your Tasks: * 1. Calculate the modulus (n) and totient function (Euler's function) (Φ(n)) required for RSA encryption. 2. Encrypt a sample message with a plain text value of 6. What is the cipher text value? 3. Decrypt the cipher text you obtained in step 2. Can you retrieve the original plain text message? **[Application]**	**(CO3)**	**(10 Marks)**

or

6.a.	Explain the steps involved in Rail fence Cipher technique **[Knowledge]**	**(CO3)**	**(04 Marks)**
6.b.	Explain the following terms 1. Cryptography 2. Cryptanalysis 3. Cryptology **[Comprehension]**	**(CO3)**	**(06 Marks)**
6.c.	Given two prime numbers p=11 and q=13. solve the following questions a) Find out the private key and public key b) Encrypt the message "Presidency university" using above private and public key **[Application]**	**(CO3)**	**(10 Marks)**
7.a	What are the characteristics of Trade Secrets? **[Knowledge]**	**(CO4)**	**(04 Marks)**
7.b.	Explain the following with respect to patents 1. Requirement for novelty 2. Procedure for Registering a Patent **[Comprehension]**	**(CO4)**	**(06 Marks)**
7.c	List and explain Types of computer forensics **[Application]**	**(CO4)**	**(10 Marks)**

or

8.a	A company's employee is accused of stealing intellectual property. The company's IT department needs to analyze the employee's computer to find evidence of the theft briefly explain the IT act. **[Knowledge]**	**(CO4)**	**(04 Marks)**
8.b.	Compare the following Copyrights, Patents, and Trade Secrets and give a comparison table. **[Comprehension]**	**(CO4)**	**(06 Marks)**
8.c	Explain the Cyber forensic tools types and categories, Cyber forensic suite **[Application]**	**(CO4)**	**(10 Marks)**

9.a	What are the Advantages and Disadvantages of Asymmetric cipher technique? **[Knowledge]**	**(CO3)**	**(04 Marks)**
9.b	You're a historian studying a series of encrypted letters written during the American Civil War. You believe they contain vital strategic information. You suspect a simple transposition cipher was used, but there are no clues within the message itself. The cipher text reads: **SXAL IOLNB EETC HRRUA OERTI CLEWR** The message is broken up into groups of five letters, with a single space between each group. Can you decipher the message using a transposition cipher? Try different key lengths (number of columns in the matrix) to see if you can reveal the plaintext message. **[Comprehension]**	**(CO3)**	**(06 Marks)**
9.c	P and Q are two prime numbers. P=3, and Q=11. Take public key E=3. If the original message was 00111011, what will be the cipher text value and private key value according to RSA Algorithm? Again, calculate plain text value from cipher text. Show the steps involved in generating a private key using an extended Euclidian algorithm **[Application]**	**(CO3)**	**(10 Marks)**

or

10.a	Explain the following terms in detail 1. Copyright 2. Patents 3. Trade secrets **[Knowledge]**	**(CO4)**	**(04 Marks)**
10.b	You are a cyber forensic investigator working for a large retail company. The company has been alerted to a potential data breach involving customer credit card information. You are tasked with investigating the incident and identifying the source of the breach. **[Comprehension]**	**(CO4)**	**(06 Marks)**
10.c	The Cybersecurity and Infrastructure Security Agency (CISA) works for different domains. Explain each in detail **[Application]**	**(CO4)**	**(10 Marks)**