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Question Paper Code: R5H02

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Fifth Semester

R21USY502- NETWORK SECURITY

CSE (Cyber Security)

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. In what ways do network attacks differ between wired and wireless setups? CO1-U
2. What is the role of a Certificate Authority (CA) in PKI? CO1-U
3. What is the main purpose of authentication in applications? CO1-U
4. Designing a secure email system. How would you implement key distribution to ensure confidentiality? CO2- App
5. What is Public key? CO1-U
6. What is TCP session Hijacking? CO1-U
7. What are two core services provided by email security? CO1-U
8. What is the primary purpose of a VPN? CO1-U
9. A WPA2-PSK Wi-Fi network is in use. How does the four-way handshake establish security between client and AP, and how could an attacker exploit a weak passphrase to compromise it? CO1-U
10. List two types of threats that a Wireless IDPS can detect CO1-U

PART – B (5 x 16= 80 Marks)

11. (a) What are the common types of attacks that can occur in network security? CO1- U (16)

Or

- (b) What are the different types of electronic signatures, and how do they differ in terms of legal and technical assurance? What is the difference between E signature and Digital Signature? CO1- U (16)

12. (a) A developer is implementing a firmware update mechanism. How can CMAC be applied to verify the authenticity of the firmware before installation? CO2-App (16)
- Or
- (b) A network administrator wants to verify the authenticity of logs sent from distributed systems. How would you apply a MAC scheme to accomplish this task efficiently and securely? CO2-App (16)
13. (a) Explain in detail about Wireshark Tool? CO1- U (16)
- Or
- (b) Describe the main approaches to IP Spoofing, DNS Spoofing and ARP Spoofing? CO1- U (16)
14. (a) Explain the concept of email security. Discuss the major threats to email communication and describe how services like authentication, confidentiality, integrity, and non-repudiation are ensured in secure email systems. CO1- U (16)
- Or
- (b) What is S/MIME and how does it enhance the security of email communication? Explain the role of digital certificates in S/MIME, and compare its features and use cases with PGP. CO1- U (16)
15. (a) An organization has recently experienced a coordinated cyber-attack that evaded signature-based intrusion detection. How the Management is apply network's security posture to include both identification and mitigation capabilities. CO2-App (16)
- Or
- (b) Apply the Wi-Fi infrastructure and wants a deep understanding of the WPA/WPA2 four-way handshake and associated security vulnerabilities, such as weak passphrases and KRACK in a Company. CO2-App (16)