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**Presidency University**

**Bengaluru**

**School Of Computer Science and Engineering & Information Science**

**Summer Term End-Term Examinations, Aug 2024**

**Date**: 07-08-2024

**Time**: 9.30AM -12.30 PM

**Max Marks**: 100

**Weightage**: 50%

**Odd Semester**: 2023 - 24

**Course Code**: CSE2058

**Course Name**: Firewall and Internet Security

**Department:** SOIS&CSE

**Instructions:**

1. *Read the all questions carefully and answer accordingly.*
2. *Do not write any matter on the question paper other than roll number.*

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| **Q.No** | **Questions** | **Marks** | **CO** | **RBT** |
| 1 | 1. Illustrate various types of Firewalls. | 4 | CO1 | L1 |
| 1. Explain about the packet filtering firewall. | 6 | CO1 | L2 |
| 1. Compare and contrast packet-filtering firewalls and stateful inspection firewalls. What are the key differences in how they operate? | 10 | CO1 | L3 |
| OR | | | | |
| 2 | 1. Define a firewall and explain its primary function in a computer network. | 4 | CO1 | L1 |
| 1. Describe about the application-level filtering. | 6 | CO1 | L2 |
| 1. Discuss the key considerations for configuring a firewall, including setting up rules, access control lists, and logging. How does firewall configuration vary depending on its location within the network? | 10 | CO1 | L3 |

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| 3 | 1. What are two common approaches to computer security? Briefly describe the principle of **confidentiality** in computer security. | 4 | CO2 | L1 |
| 1. What are the primary concerns for web security? Provide two examples of vulnerabilities that web applications may face. | 6 | CO2 | L2 |
| 1. Compare SSL and TLS. How do they work to secure data transmission, and what are the main differences between them? | 10 | CO2 | L3 |

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| 4 | 1. Discuss the differences between **active** and **passive** attacks, providing examples of each. | 4 | CO2 | L1 |
| 1. Define **integrity** and **availability** in the context of computer security. Why are they important? | 6 | CO2 | L2 |
| 1. Analyze the **layered security approach**. How does it provide comprehensive protection compared to a single security measure? | 10 | CO2 | L3 |

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| 5 | 1. Briefly explain the concept of public-key cryptography. | 4 | CO3 | L1 |
| 1. Describe the role of hash functions in network security and provide an overview of the Secure Hash Algorithm (SHA) family. | 6 | CO3 | L2 |
| 1. Explain DES in terms of their structure, security features, and applications. | 10 | CO3 | L3 |

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| 6 | 1. What is the main principle behind symmetric-key cryptography? | 4 | CO3 | L1 |
| 1. How does the Diffie-Hellman Key-Exchange Protocol facilitate secure communication? | 6 | CO3 | L2 |
| 1. Provide a detailed explanation of the RSA algorithm, including key generation, encryption, and decryption processes. Perform encryption and decryption using RSA Alg. for the following: P=7; q=11; e=17; M=8. | 10 | CO3 | L3 |

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| 7 | 1. What is the primary purpose of Kerberos in network security? | 4 | CO4 | L1 |
| 1. Describe the differences between transport mode and tunnel mode in IPsec. Provide examples of scenarios where each mode is appropriate. | 6 | CO4 | L2 |
| 1. Discuss the different categories of cyber crime, including crimes against individuals, government, and property. Provide examples and explain the potential consequences of these crimes on the victims and society at large. | 10 | CO4 | L3 |

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| 8 | 1. What is the main function of the Encapsulating Security Payload (ESP)? | 4 | CO4 | L1 |
| 1. Discuss the importance of email security and describe one method used to secure email communications. | 6 | CO4 | L2 |
| 1. Provide a detailed explanation of the Kerberos authentication protocol, including its key components (AS, TGS, SS) and the steps involved in the authentication process. | 10 | CO4 | L3 |

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| 9 | 1. What are two key elements of network security? | 4 | CO1 | L1 |
| 1. Differentiate between hardware firewalls and software firewalls. What are the advantages and disadvantages of each? | 6 | CO1 | L2 |
| 1. Explain the concept of public-key cryptography in detail. Discuss the roles of the public and private keys, and the security benefits they provide. | 10 | CO1 | L3 |

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| 10 | 1. What is the purpose of **encryption** in network security? | 4 | CO2 | L1 |
| 1. Describe the basic working mechanism of a firewall. How does it use rules to filter network traffic? | 6 | CO2 | L2 |
| 1. Explain the challenges associated with securing email communications and discuss various techniques used to protect emails, including the use of encryption and digital signatures. | 10 | CO2 | L3 |