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# MSE–031

## MASTER OF SCIENCE
## (INFORMATION SECURITY)
## (MSCIS)
## Term-End Examination
## June, 2025

### MSE-031 : CYBERSECURITY USING PYTHON

*Time : 3 Hours* *Maximum Marks : 100*

***Note :*** *Question No.* ***1*** *is compulsory. Attempt any* ***four*** *questions from the rest.*

1. Define the following terminologies with suitable example for each (any *four*) : 4×5=20

   (a) Decorator in Python

   (b) Log Analysis

   (c) Pandas Library

   (d) Incident Response

   (e) Socket Library

2. Attempt any *four* questions from the following : 4×5=20

   (a) Describe DDoS (Distributed Denial of Service) attacks and discuss their impact on online services. How can organisations mitigate the effects of DDoS attacks ? 5

   (b) What is endpoint security and why is it crucial in cybersecurity ? Describe the measures and technologies used to secure endpoints such as computers and mobile devices. 5

   (c) Describe cross-site attacks. Explain with an example. 5

   (d) What is the role of encryption in cyber-security ? Explain the difference between symmetric and asymmetric encryption algorithms. 5

   (e) Explain the concept of a firewall in the context of network security. How does it protect a network from unauthorized access ? 5

3. Provide a detailed explanation of the top 10 web-based attacks commonly encountered in cybersecurity. For each attack describe the methodology, potential impact and recommended preventive measures. Discuss how Python can be used to detect and mitigate these attacks effectively. 20

4. Explain various network-based attacks commonly encountered in cybersecurity. Choose *one* specific network-based attack and provide a step-by-step guide to implementing a sniffer code using Python to detect and analyse this attack in a network environment. Discuss the significance of such tools in monitoring and defending against network-based threats. 20

5. (a) Explain the difference between Python 2 and Python 3, highlighting the key reasons for transitioning to Python 3. 10

   (b) Describe the Python's Object-Oriented Programming (OOP) features, including classes, objects and inheritance and provide an example for each. 10

6. (a) Discuss the significance of Python libraries and packages in expanding the language's capabilities. Name *three* popular Python libraries and describe their typical usecases. 10

   (b) Explain the principles of Cryptography and how Python can be utilized to implement encryption and decryption algorithms for secure data communication. 10

7. (a) What are Python data structures and how do lists, tuples and dictionaries differ in terms of their properties and usecases ? 10

   (b) Discuss the importance of threat modelling in cybersecurity. Explain how Python can assist in creating threat models and conducting risk assessments. 10

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