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MSE–031

MASTER OF SCIENCE
(INFORMATION SECURITY) (MSCIS)
Term-End Examination
December, 2024

MSE-031 : CYBER SECURITY USING PYTHON

Time : 3 Hours *Maximum Marks : 100*

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

1. Define the following terminologies with suitable example for each (any *four*) : 4×5=20
   (a) Zero-day vulnerability
   (b) Asyncio in Python
   (c) Threat Intelligence
   (d) List comprehension in Python
   (e) CIA Triad

2. Attempt any *four* questions from the following : 4×5=20
   (a) Describe the purpose of the Python pip package manager. How is it used to install and manage Python packages and libraries ?

(b) Describe phishing attack in cyber security. Discuss common phishing techniques and how individuals and organizations can protect themselves against such attacks.

(c) Illustrate Python's lambda functions and discuss its usecases and limitations. Provide an example of a lambda function in Python.

(d) Explain the concept of zero-day vulnerabilities in cyber security. How do security researchers and organizations handle these vulnerabilities ?

(e) Describe Python's list comprehensions and generator expressions. Provide examples of each and explain their differences.

3. (a) How can Python be utilized for network scanning and reconnaissance in ethical hacking ? Provide supporting example script or code snippet. 10

(b) Describe the role of Python in log analysis and intrusion detection. How can Python scripts be used to detect and respond to security incidents effectively ? 10

4. (a) Explain the process of creating a virtual environment in Python. Why is it important for managing dependencies and isolating projects ? 10

   (b) Discuss the significance of web application security testing. How Python can be applied to automate the testing of web applications for vulnerabilities ? 10

5. (a) Describe the concept of threat intelligence. How Python can assist in collecting, analyzing and sharing threat intelligence data ? 10

   (b) Explain how Python Pandas can be used to read data from an Excel file and transfer it into a Dataframe. Provide a step-by-step guide, including code examples, for loading data from an Excel file into a Pandas Dataframe. Additionally, discuss the advantages of using Pandas for data manipulation and analysis in conjunction with Excel files. 10

6. Design and create a Python library with *two* methods, one for generating strong random passwords and another for encrypting and decrypting sensitive data. Provide code examples for both methods within the library.

Demonstrate how to import and use these methods in another Python program focused on enhancing cyber security. 20

7. Describe the model of social media analysis using Python. Provide a step-by-step explanations of the process, from data collection to insights generation. Illustrate your explanation with practical examples showcasing how Python can be utilized to analyze social media data, extract meaningful insights and present the results. 20

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