Name : Enrolment No. :	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2024

Program Name : BCA CSSF3021 — Semester : V^{th}
Course Name : Cyber Security — Time : 3 hours
Course Code : CSSF 3021 — Max. Marks : 100
No. of Page(s) : 2
Instructions : Attempt all sections.

SECTION-A

S. No.	Questions	Marks	CO
Q.1	Illustrate with an example how a cyber attack can disrupt an information system.	4	CO 1
Q.2	Propose a basic framework for an organization to protect itself from various cyber attacks. Discuss how each element addresses specific threats.	4	CO 2
Q.3	Illustrate how a digital signature verifies the authenticity of a message.	4	CO 1
Q.4	Show how public and private keys are used in asymmetric cryptography.	4	CO 3
Q.5	Provide an example of a cybercrime under the Indian Penal Code (IPC) and explain how the provisions of the IPC are applied to address it.	4	CO 4
	SECTION-B		
Q.6	Analyze the classification of cyber attacks by categorizing them into different types. Provide examples and evaluate how each type impacts individuals and organizations.	10	CO 1
Q.7	Design a secure communication protocol using symmetric and asymmetric cryptography. Describe how it ensures confidentiality, integrity, and authenticity.	10	CO 2
Q.8	Compare the performance of two symmetric ciphers: a) Cipher A encrypts a 512-bit block in 2 ms. b) Cipher B encrypts a 256-bit block in 1 ms. If both ciphers encrypt a 1 GB file, which one is faster, and by how much time?	10	CO 3
Q.9	Analyze the role of message authentication in modern communication systems. Compare different techniques used for message authentication, including MAC and HMAC, highlighting their strengths and weaknesses. OR Evaluate the efficiency of a hashing function: If generating one hash takes 0.5 ms, how long does it take to hash 1 million messages? Discuss whether this is suitable for real-time systems.	10	CO 4
	SECTION-C		

Q.10	Evaluate the current state of cyber security awareness in India. Assess its impact on the prevention of cybercrimes and propose a detailed strategy for improving public awareness and institutional readiness. OR Illustrate the use of asymmetric key cryptography in securing e-commerce transactions. Explain the role of public and private keys in ensuring confidentiality and authenticity.	20	CO 1 & CO 2
Q.11	Compare and contrast the applications of symmetric key and asymmetric key cryptography in real-world scenarios, such as online banking and email encryption. Discuss their advantages and limitations.	20	CO 3 & CO 4