

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES (UPES)

End Semester Examination, May 2023

Program Name : Master of Technology

Semester : II

Course Name : Security of E-Systems and Networks

Time : 3 hr

Course Code : CSCS 7004

Max. Marks : 100

Nos. of page(s) : 02

Instructions :

1. Attempt all the sections.
2. The question paper consists of 11 questions, and it is divided into three sections A, B, and C.
3. Section A comprises of 5 questions carrying 4 marks and to be answered in approximately 40-50 words each.
4. Section B comprises of 4 questions carrying 10 marks and to be answered in approximately 100-120 words each.
5. Section C comprises of 2 questions carrying 20 marks and to be answered in approximately 180-200 words each.
6. There is an option for question no. 9. Solve anyone.
7. There is an option for question no. 11. Solve anyone.

SECTION A

Q. No.	Question	Marks	CO
1	Discuss the key components of a network and their roles in establishing connectivity and facilitating data exchange.	2+2=4	CO1
2	Explain the concept of proxy servers and their role in network communication.	2+2=4	CO2
3	Explain the TCP/IP protocol suite and its significance in modern data communication.	2+2=4	CO1
4	Discuss the importance of regular updates, patches, and monitoring in maintaining network security and protecting against emerging threats.	4	CO3
5	Describe the concept of network layer security and the techniques used to secure data transmission over networks.	2+2=4	CO3

SECTION B

6	Explain the process of establishing a home network, including the selection of networking devices, such as routers, switches, and access points, and their configurations. Discuss the challenges and considerations in setting up a secure and reliable home network, including IP addressing, network sharing, and device connectivity.	5+5=10	CO2
7	Discuss the relationship between networking and the internet. Explain the key concepts of internet architecture, such as IP addresses, domain names, and protocols,	6+4=10	CO1

	and their role in establishing global connectivity and facilitating communication and data exchange.		
8	Explore the concept of firewalls in network security. Discuss the different types of firewalls, and their placement in a network architecture. Also, analyze their functionalities, strengths, and weaknesses of each type of firewall, and propose strategies for managing and configuring firewalls in a network environment.	2+4+4=10	CO3
9	Discuss the different Network Operating Systems (NOS) and their functionalities in managing and controlling network resources. Explain the features and advantages of popular NOS, such as Windows Server, Linux-based NOS, and Novell NetWare, and their roles in network administration. OR Examine the critical role of a network administrator in ensuring network security. Discuss the responsibilities, skills, and best practices of a network administrator in managing and securing a network environment. Analyze the challenges and potential risks associated with network administration and propose effective strategies to mitigate these risks.	3+3+4=10	CO1
SECTION-C			
10	Analyze the legal, ethical, and privacy considerations associated with network security. Discuss the ethical implications of network security practices, including surveillance, data collection, and user privacy, and evaluate the legal and regulatory frameworks governing network security at the national and international levels.	8+12=20	CO4
11	Write a case study or empirical research on real-world incidents of network security breaches or cyber-attacks. Also, analyze the root causes, impact, and lessons learned from these incidents, and propose effective strategies to prevent or mitigate similar incidents in the future. OR Explore the challenges and best practices associated with email security. Discuss the potential threats and vulnerabilities associated with email communication, and suggest effective measures to secure email communication, including the use of multi-purpose mail extension (MIME) for secure email attachments.	10+10=20	CO5