C **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: U4E06

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Fourth Semester

Artificial Intelligence and Data Science

21UAD406 - COMPUTER NETWORK AND SECURITY

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5 x 1 = 5Marks)

1. _____is a real-time example for the Physical Layer CO1 U

   (a) Hub (b) Router (c) Coaxial Cable (d) IP Address

2. _____key features is relevant to wireless LANs?. CO1 U

   (a) Wired LANs (b) IEEE 802.11

   (c) Data-Link Layer Protocols (d) Internet Protocols (IPv4and IPv6)

3. _____is an example for file transfer CO1 U

   (a) Email (b) WWW and HTTP (c) FTP (d) Telnet

4. Which of the following is an objective of network security? CO1 U

   (a) Confidentiality (b) Integrity (c) Availability (d) All of the above

5. Network layer firewall works as a _____ CO1 U

   (a) Frame filter (b) Packet filter (c) Content filter (d) Virus filter

PART – B (5 x 3= 15 Marks)

6. Assume 6 devices are arranged in a mesh topology. How many cables are needed? How many ports are needed for each device? CO2 App

7. Find the hamming distance between two pair of code words : CO2 App

   A = 01011

   B = 11110

8. Give the format of HTTP response message? CO1 U

9. What are two common techniques used to protect a password file? CO1 U

10. What is honey pot? CO1 U

PART – C (5 x 16= 80 Marks)

11. (a) Apply the concept of TCP/IP models in any social media application and explain in detail about TCP/IP Layers and Architecture of the Protocol with neat diagrammatic representation. CO2 App (16)

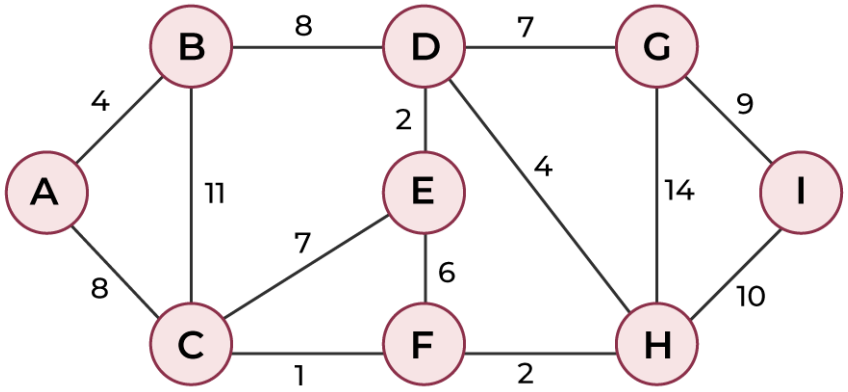
Or

(b) Apply the concept of ISO/OSI layers in any social media application and clearly explain their layers ad its functionalities in detail with neat diagrammatic representation. CO2 App (16)

12. (a) A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x 4 +x+1. What is the actual bit string transmitted? CO2 App (16)

Or

(b) Find the shortest path tree and the routing table for router I (8 m) CO2 App (16)
Find the shortest path tree and the routing table for router E (8 m)



13. (a) Compare and contrast various application layer protocols such as HTTP, FTP, Telnet, and DNS. Highlight their specific functionalities and their significance in supporting different types of network applications. CO1 U (16)

Or

(b) Explain how QoS is provided through Differentiated Services. CO1 U (16)

14.	(a)	(i) Assuming that everyone on the Internet used PGP, could a PGP message be sent to an arbitrary Internet address and be decoded correctly by all concerned? Justify it. (8m) (ii) Point-of-sale terminals that use magnetic-stripe cards and PIN codes have a fatal flaw: a malicious merchant can modify his card reader to log all the information on the card and the PIN code in order to post additional (fake) transactions in the future. Next generation terminals will use cards with a complete CPU, keyboard, and tiny display on the card. Devise a protocol for this system that malicious merchants cannot break. (8m)	CO2 App	(16)
		Or		
	(b)	(i) Can a machine with a single DNS name have multiple IP addresses? How could this occur? (4m) (ii) Electronic mail systems need directories so people's email addresses can be looked up. To build such directories, names should be broken up into standard components (e.g., first name, last name) to make searching possible. Discuss some problems that must be solved for a worldwide standard to be acceptable. (12m)	CO2 App	(16)
15.	(a)	Discuss the types and characteristics of malicious software, including viruses. Explore how firewalls and security standards help mitigate the risks associated with malicious software.	CO1 U	(16)
		Or		
	(b)	How does screened host architecture for firewalls differ from screened subnet firewall architecture? Which offers more security for information assets on trusted network? Explain with neat sketch.	CO1 U	(16)