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Question Paper Code: R4E06

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Fourth Semester

R21UAD406 - COMPUTER NETWORKS AND SECURITY

(Artificial Intelligence and Data Science)

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What are the two types of line configuration? CO1-U
2. Compare OSI and TCP CO1-U
3. Find the hamming distance between two pair of code words : CO2- App
A = 01011
B = 11110
4. What is the network address in a class a subnet with the IP address of one CO2- App
of the hosts as 25.34.12.56 and 255.255.0.0?
5. Differentiate congestion control and flow control CO1-U
6. What is the difference between IMAP and POP? CO1-U
7. What are the services provided by PGP services? CO1-U
8. Differentiate symmetric and asymmetric encryption. CO1-U
9. Define honey pot. CO1-U
10. Which types of Intrusion Detection Systems is suitable to your networking CO1-U
Environment and explains why?

PART – B (5 x 16= 80 Marks)

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

Or

- (b) (i) Compare and Contrast guided and unguided media for transmission CO2- App (8)
- (ii) One channel with a bit rate of 190 kbps and another with a bit rate of 180kbps are to be multiplexed using TDM with no synchronization bits. What is the size of a frame in a bits? What is the data rate? CO2- App (8)
12. (a) Suppose we want to transmit the message 1011 0010 0100 1011 and protect it from errors using the CRC-8 polynomial $x^8 + x^2 + x + 1$. CO2- App (16)
- (a) Use polynomial long division to determine the message that should be transmitted.
- (b) Suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred?
- Or
- (b) For the following IP addresses CO2- App (16)
- 10101001 10101001 11100011 10101110
 11100001 10101101 10101111 00001011
 01011010 00111111 10001101 11011011
 11110011 11101010 11001100 11001110
 11101011 01010101 10000011 01101010
- Change to dotted decimal notation (8 mark)
- Find the class of the above IP addresses (4 mark)
- Find the netid and the hostid of the above IP addresses (4mark)
13. (a) Discuss how the Simple Mail Transfer Protocol (SMTP) is useful in electronic mail. Architecture of mailing system CO1- U (16)
- Or
- (b) Explain the message transfer using Simple Mail Transfer Protocol. & explain the final delivery of email to the end user using POP3 CO1- U (16)
14. (a) Explain in detail about architecture of IP Security. CO1- U (16)
- Or
- (b) Generalize the role of intrusion detection system? Point out the three benefits that can be provided by the intrusion detection system and Prepare comparison details between statistical anomaly detection and rule based intrusion detection system? CO1- U (16)

15. (a) 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)

Or

- (b) Discuss the types of malicious software, including viruses. Evaluate the role of firewalls in preventing unauthorized access and maintaining security standards in a networked environment CO1- U (16)

