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Question Paper Code: R4E06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Fourth Semester

Artificial Intelligence & Data Science

R21UAD406 - COMPUTER NETWORKS AND SECURITY

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART - A (10 x 2 = 20 Marks)

1. What are the three fundamental characteristics determine the effectiveness of the data communication system? CO1- U
2. What are the three criteria necessary for an effective and efficient network? CO1- U
3. What is the need for subnetting? CO1- U
4. What are the issues in data link layer? CO1- U
5. Define DNS. CO1- U
6. What are the TCP connections needed in FTP? CO1- U
7. What is the need of segmentation and reassembly function in PGP? CO1- U
8. What is use of digital signature? CO1- U
9. Relate the protocols used to provide IP Security. CO1- U
10. List out the design goals of firewalls. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Define and explain in detail the differences between the following wireless communication techniques: CO1- U (16)
 1. Guided Medium
 2. Unguided Medium
- Or
- (b) Explain how Time Division Multiplexing (TDM) can be used to build a telephone network system. Describe the functionalities of TDM, its various types, and provide detailed diagrams to help illustrate the working of TDM. CO1- U (16)

12. (a) Explain the various types of error .Discuss the various types of
Detection and correction CO1- U (16)
- Or
- (b) What if the IEEE standards are nor followed. Explain the
physical properties of Ethernet 802.3 with necessary diagram of
Ethernet transceiver and adaptor CO1- U (16)
13. (a) Explain the Association establishment of SCTP through four-
way handshake in detail. CO1- U (16)
- Or
- (b) How is congestion controlled? Explain in detail about congestion
control techniques in transport layer. CO1- U (16)
14. (a) With an example explain the authentication using Kerberos and
public key cryptography CO1- U (16)
- Or
- (b) Assume the diagrams to show how PGP provides authentication
and confidentiality for email services and for the transfer
applications. CO1- U (16)
15. (a) Examine the message transfer using Simple Mail Transfer
Protocol. CO3-Ana (16)
Analyze the basics of POP3 and IMAP mail access protocols.
- Or
- (b) Give one reason why a firewall might be configured to inspect
incoming traffic and outgoing traffic. Do you think the
inspections are likely to be successful? CO3-Ana (16)