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**Reg. No. :**

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**Question Paper Code: U4E06**

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

Fourth Semester

Artificial Intelligence & 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. Connection of telephone regional office is practical example of CO1-U  
(a) Ring                      (b) Hybrid                      (c) Mesh                      (d) Bus
2. The maximum size of payload field in Ethernet frame is CO1-U  
(a) 1000 bytes                      (b) 1200 bytes                      (c) 1300 bytes                      (d) 1500 bytes
3. For a host machine that uses the token bucket algorithm for congestion control, the token bucket has a capacity of 1 megabyte and the maximum output rate is 20 megabytes per second. Tokens arrive at a rate to sustain output at a rate of 10 megabytes per second. The token bucket is currently full and the machine needs to send 12 megabytes of data. The minimum time required to transmit the data is \_\_\_\_\_ seconds. CO2-App  
(a) 1.1                      (b) 0.1                      (c) 2.1                      (d) 2.0
4. \_\_\_\_\_ is the method for keeping sensitive information in email communication & accounts secure against unofficial access, loss, or compromise. CO1-U  
(a) Email security                      (b) Email hacking                      (c) Email protection                      (d) Email safeguarding
5. A stateful firewall maintains a \_\_\_\_\_ which is a list of active connections. CO1-U  
(a) Routing table                      (b) Bridging table                      (c) State table                      (d) Connection table

PART – B (5 x 3= 15Marks)

- |     |   |       |
|-----|---|-------|
| 6.  | What are header and trailers and how do they get added and removed? | CO1-U |
| 7.  | Explain the main idea of UDP?                                       | CO1-U |
| 8.  | Give the format of HTTP response message                            | CO1-U |
| 9.  | What are the types of MIME?   | CO1-U |
| 10. | Define honey pot.   | CO1-U |

PART – C (5 x 16= 80Marks)

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|-----|---|---------|------------|
| 11. | (a) Discuss about ISO/OSI reference model with neat sketch  | CO1-U   | (16)       |
|     | Or  |         |            |
|     | (b) Explain in detail about circuit switching and datagram switching with diagram   | CO1-U   | (16)       |
| 12. | (a) Generate the Hamming code for the following 8 bit binary number.<br>11000100.<br>a. Show the parity bit positions and the given number.<br>b. Show your work on how the parity bit was calculated.  | CO2-App | (16)       |
|     | Or  |         |            |
|     | (b) Suppose we want to transmit the message 1011 0010 0100 1011 and protect it from errors using the CRC-8 polynomial $x^8 + x^2 + x^1 + 1$ .<br>(a) Use polynomial long division to determine the message that should be transmitted<br>(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 and How does the receiver know that an error has occurred? | CO2-App | (16)       |
| 13. | (a) Compare the QOS in terms of Integrated Services and Differentiated Services for banking application and also list out the algorithm with traffic shaping.   | CO3-Ana | (16)       |
|     | Or  |         |            |
|     | (b) (i) Examine the message transfer using Simple Mail Transfer Protocol.<br>(ii) Analyze the basics of POP3 and IMAP mail access protocols?  | CO3-Ana | (8)<br>(8) |

14. (a) Explain kerberos authentication mechanism with suitable diagram? CO1-U (16)
- Or
- (b) Explain in detail about the security services (PGP, S/MIME) for E-mail. CO1-U (16)
15. (a) Explain about Malicious Software CO1-U (16)
- Or
- (b) What is a honeypot and How do honeypots work? CO1-U (16)