

**B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024**

(Regulation 2018)

Fourth Semester

**INFORMATION TECHNOLOGY**

U18ITI4204: Computer Networks

**COURSE OUTCOMES**

- CO1:** Outline the data communication system and the purpose of layered architecture
- CO2:** Explain the data link layer protocols.
- CO3:** Outline the network layer protocols.
- CO4:** Apply the network layer concepts to solve a problem.
- CO5:** Illustrate the functions of transport layer protocols.
- CO6:** Summarize the application layer protocols

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

1. Change the following IPv4 addresses from dotted-decimal notation to binary notation. CO1 [K<sub>3</sub>]  
a) 221.34.7.82 b) 111.56.45.78
2. What is guided media? What are the different types of guided media commonly used in networking? CO1 [K<sub>2</sub>]
3. Suppose the following sequence of bits arrive over a link: CO2 [K<sub>3</sub>]  
011010111110101001111111011001111110  
Show the resulting frame after any stuffed bits have been removed. Indicate any errors that might have been introduced into the frame.
4. Why is IPv6 is preferred over IPv4? CO3 [K<sub>2</sub>]
5. Compare between connection oriented and connectionless service. CO3 [K<sub>2</sub>]
6. What is two node infinity problem? How to solve it? CO4 [K<sub>2</sub>]
7. Compare the salient features of TCP and UDP. CO5 [K<sub>2</sub>]
8. Discuss any two techniques for improving the QoS. CO5 [K<sub>2</sub>]
9. State the role of DNS. CO6 [K<sub>2</sub>]
10. Determine which of the following is an FQDN and which is a PQDN. CO6 [K<sub>3</sub>]

- a. mil.
- b. edu.
- c. xxx.yyy.net
- d. zzz.yyy.xxx.edu

**Answer any FIVE Questions:-**  
**PART B (5 x 16 = 80 Marks)**  
**(Answer not more than 400 words)**

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|-----|----|--|-----|-------------------|
| 11. | a) | Describe each layer of the OSI model, focusing on its function and protocols associated with it.   | CO1 | [K <sub>2</sub> ] |
|     | b) | Describe the three topologies of computer networks and discuss the advantages and disadvantages of each.   | CO1 | [K <sub>2</sub> ] |
| 12. | a) | Explain the working of IEEE802.3 standard.   | CO2 | [K <sub>2</sub> ] |
|     | b) | Suppose we want to transmit the message 11001001 and protect it from errors using the CRC polynomial $x^3 + 1$ . Use polynomial long division to determine the message that should be transmitted. | CO2 | [K <sub>3</sub> ] |
| 13. | a) | For the given network, explain how Distance vector routing technique works.  | CO4 | [K <sub>3</sub> ] |
|     | b) | Define circuit switching and explain how it works in data communication  | CO3 | [K <sub>2</sub> ] |
| 14. | a) | Demonstrate the three-way handshaking protocol for TCP connection establishment and termination  | CO5 | [K <sub>2</sub> ] |
|     | b) | Explain the different open-loop congestion control techniques used to prevent congestion in a network.   | CO5 | [K <sub>2</sub> ] |
| 15. | a) | Explain the Stop-and-Wait protocol and its role in achieving reliable transmission.  | CO2 | [K <sub>2</sub> ] |

- b) Draw the IPv6 header format and explain. CO4 [K<sub>2</sub>]
16. a) User A sends an e-mail to user B, both belongs to different networks. Discuss the role of SMTP, POP and IMAP protocols in the e-mail transfer CO6 [K<sub>2</sub>]
- b) Explain the working of HTTP with a neat diagram. CO6 [K<sub>2</sub>]

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