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| **Course Name** | **:** | Computer Networks |
| **Corse Code** | **:** | CS601 |
| **Regulation** | **:** | R21 |

**Group-A**

**(Multiple Choice Questions)**

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| **Question No.** | | | **Questions** | **Marks** | **Module No.** | **CO No.** | **BT Level** |
|  |  | 1. | A \_Channel\_ defines the physical path over which a message travel | 1 | 1 | 1 | 2 |
|  |  | 2. | **Which of the following is NOT a network topology?** a)Bus b)Star c)Hybrid d) Kernel | 1 | 1 | 4 | 2 |
|  |  | 3. | **The OSI model consists of how many layers?** a)5 b)6 c)7 d) 8 | 1 | 1 | 4 | 2 |
|  |  | 4. | **What is the key difference between wired and wireless networks?** a)Wired networks are faster b)Wireless networks use electromagnetic waves for communication c)Wireless networks are more secure d) Wired networks are more complex | 1 | 1 | 4 | 3 |
|  |  | 5. | **What type of switching is used in the telephone network?** a)Packet switching b)Circuit switching c)Message switching d) Hybrid switching | 1 | 1 | 3 | 3 |
|  |  | 6. | **Which of the following transmission media is an example of guided media?** a)Fiber-optic cable b)Infrared c)Microwave d) Satellite | 1 | 1 | 4 | 2 |
|  |  | 7. | What is the purpose of framing in the Data Link Layer? a) To detect errors in data transmission b) To enable logical addressing c) To encapsulate network layer packets into frames d) To facilitate congestion control | 1 | 2 | 5 | 3 |
|  |  | 8. | Which of the following is NOT an error detection method? a)Checksum b)Cyclic Redundancy Check (CRC) c)Hamming Code d) Go-Back-N | 1 | 2 | 5 | 2 |
|  |  | 9. | The main difference between Go-Back-N and Selective Repeat ARQ is: a) Go-Back-N retransmits all frames after an error, while Selective Repeat only retransmits the erroneous frames b) Go-Back-N uses a larger window size than Selective Repeat c) Go-Back-N does not use acknowledgments d) Selective Repeat requires fewer sequence numbers | 1 | 2 | 4 | 4 |
|  |  | 10. | In CSMA/CD, what happens when a collision is detected? a) The transmission continues as normal b) The station stops transmitting and waits for a random backoff time c) The station terminates the connection d) The data is sent to the network administrator | 1 | 2 | 4 | 3 |
|  |  | 11. | IEEE 802.11 is a standard for: a) Ethernet b) Wireless LANs c) Bluetooth d) Fiber-optic networks | 1 | 2 | 5 | 2 |
|  |  | 12. | What is the primary difference between IPv4 and IPv6? a) IPv4 supports more addresses b) IPv6 has a larger address space c) IPv6 does not use headers d) IPv4 supports encryption by default | 1 | 3 | 4 | 3 |
|  |  | 13. | What is subnetting used for? a) Increasing network speed b) Reducing the size of the routing table c) Encrypting network traffic d) Improving wireless connectivity | 1 | 3 | 5 | 4 |
|  |  | 14. | RIP uses which type of routing algorithm? a) Distance Vector b) Link State c) Hybrid d) Dynamic Routing | 1 | 3 | 4 | 2 |
|  |  | 15. | Which protocol is used for automatic IP address assignment? a)ICMP b)DHCP c)ARP d) BGP | 1 | 3 | 5 | 2 |
|  |  | 16. | Which transport layer protocol is connection-oriented? a)UDP b)TCP c)ICMP d) IP | 1 | 4 | 4 | 3 |
|  |  | 17. | Which congestion control algorithm uses a token-based approach? a)Leaky Bucket b)Distance Vector Routing c)Go-Back-N d) Stop-and-Wait | 1 | 4 | 5 | 3 |
|  |  | 18. | Which protocol is used for sending emails? a) HTTP b) SMTP c) FTP d) SNMP | 1 | 5 | 5 | 2 |
|  |  | 19. | What does DNS do? a) Encrypts network traffic b) Resolves domain names to IP addresses c) Routes data packets d) Detects network congestion | 1 | 5 | 5 | 3 |
|  |  | 20. | What is the difference between TCP and UDP sockets? a) TCP sockets are connection-oriented, UDP sockets are connectionless b) UDP sockets are more reliable than TCP sockets c) TCP sockets do not use acknowledgments d) UDP sockets are slower than TCP sockets | 1 | 6 | 5 | 3 |
|  |  | 21. | Which of the following is a sliding window protocol? a) Stop-and-Wait ARQ b) Selective Repeat ARQ c) ALOHA d) CSMA/CD | 1 | 2 | 5 | 3 |
|  |  | 22. | HDLC is a: a) Layer 2 protocol b) Layer 3 protocol c) Layer 4 protocol d) Layer 5 protocol | 1 | 2 | 4 | 2 |
|  |  | 23. | Which multiple access protocol is used in Ethernet? a) ALOHA b) CSMA/CD c) Token Ring d) TDMA | 1 | 2 | 4 | 3 |
|  |  | 24. | What is the frame size in Ethernet? a) 64 bytes to 1518 bytes b) 32 bytes to 1024 bytes c) 128 bytes to 2048 bytes d) 256 bytes to 4096 bytes | 1 | 2 | 5 | 2 |
|  |  | 25. | Which IEEE standard defines Gigabit Ethernet? a) IEEE 802.3 b) IEEE 802.5 c) IEEE 802.11 d) IEEE 802.15 | 1 | 2 | 4 | 2 |
|  |  | 26. | What is the main function of ICMP? a) Routing b) Error reporting and diagnostics c) Packet switching d) Address translation | 1 | 3 | 5 | 3 |
|  |  | 27. | Which routing protocol uses the Link State Algorithm? a)RIP b)OSPF c)BGP d) DHCP | 1 | 3 | 4 | 3 |
|  |  | 28. | The address 192.168.1.1 belongs to which class? a)Class A b)Class B c)Class C d) Class D | 1 | 3 | 4 | 2 |
|  |  | 29. | Which protocol is used for multicast routing? a) RIP b) IGMP c) OSPF d) BGP | 1 | 3 | 4 | 3 |
|  |  | 30. | What is the function of a router? a) Connects multiple networks and forwards packets b) Converts digital signals to analog signals c) Prevents unauthorized network access d) Provides IP addresses dynamically | 1 | 3 | 5 | 3 |
|  |  | 31. | What is the main function of TCP? a) Packet switching b) Flow and congestion control c) Address translation d) Error detection only | 1 | 4 | 5 | 3 |
|  |  | 32. | Which of the following does UDP lack? a) Reliability b) Flow control c) Error recovery d) All of the above | 1 | 4 | 4 | 2 |
|  |  | 33. | What is the main purpose of SCTP? a) Secure data transmission b) Multiplexing multiple data streams c) Faster communication d) Reducing congestion | 1 | 4 | 5 | 3 |
|  |  | 34. | TCP Reno improves congestion control using: a) Fast retransmit and fast recovery b) Token bucket algorithm c) Leaky bucket algor  ithm d) Stop-and-Wait ARQ | 1 | 4 | 4 | 3 |
|  |  | 35. | The Token Bucket algorithm is used for: a) Flow control b) Congestion control c) Error detection d) Packet switching | 1 | 4 | 5 | 3 |
|  |  | 36. | FTP uses which transport layer protocol? a) TCP b) UDP c) ICMP d) ARP | 1 | 5 | 5 | 2 |
|  |  | 37. | Which protocol is used to retrieve emails from a server? a) POP3 b) SMTP c) SNMP d) ARP | 1 | 5 | 4 | 2 |
|  |  | 38. | What is the main function of HTTP? a) Sending emails b) Web browsing c) Network security d) IP address assignment | 1 | 5 | 5 | 2 |
|  |  | 39. | Digital signatures provide: a) Authentication and integrity b) Encryption only c) Faster data transmission d) Address resolution | 1 | 5 | 5 | 3 |
|  |  | 40. | Firewalls operate at which OSI layer? a) Network Layer b) Transport Layer c) Data Link Layer d) Application Layer | 1 | 5 | 4 | 3 |
|  |  | 41. | What is the purpose of a socket? a) It enables communication between processes over a network b) It encrypts data before transmission c) It provides physical layer connectivity d) It is used for error detection | 1 | 6 | 5 | 3 |
|  |  | 42. | A UDP socket is best suited for: a) Real-time applications b) Secure data transmission c) File transfer d) Guaranteed delivery | 1 | 6 | 5 | 3 |
|  |  | 43. | TCP sockets are: a) Connection-oriented b) Connectionless c) Used only for broadcasting d) Only available in IPv6 | 1 | 6 | 4 | 2 |
|  |  | 44. | Which function is used to create a socket in C? a) socket() b) bind() c) listen() d) connect() | 1 | 6 | 5 | 3 |
|  |  | 45. | What is the default port number for HTTP? a) 80 b) 21 c) 25 d) 53 | 1 | 6 | 5 | 2 |
|  |  | 46. | Which protocol resolves an IP address to a MAC address? a) ARP b) RARP c) DHCP d) ICMP | 1 | 3 | 5 | 3 |
|  |  | 47. | Which switching method is used in traditional telephone networks? a) Circuit Switching b) Packet Switching c) Message Switching d) Cell Switching | 1 | 1 | 4 | 2 |
|  |  | 48. | Which protocol is used for network device management? a) SNMP b) SMTP c) FTP d) POP3 | 1 | 5 | 4 | 3 |
|  |  | 49. | The primary advantage of a Virtual LAN (VLAN) is: a) Reduced network congestion b) Increased physical security c) Faster data transfer over the internet d) Elimination of all broadcast traffic | 1 | 2 | 5 | 3 |
|  |  | 50. | What is the primary role of the Transport Layer? a) Routing packets across networks b) Ensuring reliable data transmission c) Assigning IP addresses d) Converting digital signals to analog | 1 | 4 | 5 | 3 |

**\* Please don’t add any column in the above table. However, you may add rows as per requirement.**

**Group-B**

**(Short Answer Type Questions)**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question No.** | | | **Questions** | **Marks** | **Module No.** | **CO No.** | **BT Level** |
|  |  | 1. | Define each of the fundamental components of data communication systems? | 5 | 1 | 1 | 3 |
|  |  | 2. | Describe the concept of data flow in a network | 5 | 1 | 1 | 3 |
|  |  | 3. | Name three common types of network topologies and provide a brief explanation of each | 5 | 1 | 1 | 3 |
|  |  | 4. | Define the OSI model and list its seven layers | 5 | 2 | 2 | 3 |
|  |  | 5. | What are the different types of transmission media used in data communication? | 5 | 2 | 2 | 2 |
|  |  | 6. | Describe the concept of multiplexing and why it is used in networking? | 5 | 2 | 2 | 3 |
|  |  | 7. | Differentiate between LAN, MAN and WAN | 5 | 1 | 1 | 3 |
|  |  | 8. | Highlight the advantages and disadvantages of Mesh topology | 5 | 1 | 1 | 4 |
|  |  | 9. | Explain the primary function of the Data Link Layer in a network | 5 | 3 | 3 | 3 |
|  |  | 10. | What is the primary difference between User Datagram Protocol (UDP) and Transmission Control Protocol (TCP) in the context of process-to-process communication? | 5 | 4 | 4 | 3 |
|  |  | 11. | Explain the role of DNS (Domain Name System) | 5 | 5 | 5 | 3 |
|  |  | 12. | A data link layer protocol uses a sliding window with a sender window size of 8 frames. If the sender has sent frames 1 to 10, and the acknowledgment for frame 4 is lost, calculate how many frames the sender will retransmit before it can proceed with new frames. | 5 | 3 | 3 | 5 |
|  |  | 13. | In a selective repeat ARQ protocol, the sender sends a window of 10 frames, and the receiver has a buffer of 20 frames. If the sender sends frames 1 to 10, and frame 5 gets lost in transit, calculate the number of acknowledgments the receiver will send before it can successfully receive all frames | 5 | 4 | 4 | 5 |
|  |  | 14. | Examine the difference between Pure and Slotted ALOHA. | 5 | 5 | 5 | 4 |
|  |  | 15. | Explain the purpose of the RARP (Reverse ARP) protocol. How does it work, and in what scenarios might it be used in a network? | 5 | 3 | 3 | 3 |
|  |  | 16. | Suppose a network with IP Address 192.16.0.0. is divided into 2 subnets, find number of hosts per subnet. Also for the first subnet, estimate the Subnet Address, First Host ID, Last Host ID, Broadcast Address | 5 | 3 | 3 | 5 |
|  |  | 17. | Explain the UDP datagram format with a diagram | 5 | 4 | 4 | 3 |
|  |  | 18. | Analyze the functions of Presentation Layer in OSI Model | 5 | 5 | 5 | 4 |
|  |  | 19. | Describe about the different Un-Guided transmission Medias in computer networks? | 5 | 1 | 1 | 3 |
|  |  | 20. | Describe the fundamental purpose of the Transport Layer in the OSI model and how it facilitates process-to-process communication | 5 | 4 | 4 | 3 |
|  |  | 21. | What is the primary difference between User Datagram Protocol (UDP) and Transmission Control Protocol (TCP) | 5 | 4 | 4 | 3 |
|  |  | 22. | Analyze the advantages and disadvantages of IPv4 and IPv6 | 5 | 3 | 3 | 4 |
|  |  | 23. | How does ARP (Address Resolution Protocol) work, and why is it important in networking? | 5 | 3 | 3 | 3 |
|  |  | 24. | Differentiate between logical addressing and physical addressing in networking | 5 | 3 | 3 | 3 |
|  |  | 25. | Illustrate the principle of piggybacking in network communication. When is it commonly used? | 5 | 3 | 3 | 4 |

**\* Please don’t add any column in the above table. However, you may add rows as per requirement.**

**Group-C**

**(Long Answer Type Questions)**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Question No.** | | | **Questions** | **Marks** | **Module No.** | **CO No.** | **BT Level** |
|  |  | 1. | Compare and contrast Go-Back-N ARQ (Automatic Repeat reQuest) and Selective Repeat ARQ in terms of error recovery in data transmission. Explain how CRC (Cyclic Redundancy Check) works as an error detection technique. | 15 | 3 | 3 | 3 |
|  |  | 2. | Estimate the features of Bloototh. Estimate the working of SMTP protocol. | 15 | 4 | 4 | 4 |
|  |  | 3. | Consider We have a big single network having IP Address 200.1.2.0. We want to do subnetting and divide this network into 3 subnets. Estimate the details of the subnetworks | 15 | 4 | 4 | 5 |
|  |  | 4. | Consider We have a big single network having IP Address 200.1.2.0. We want to do subnetting and divide this network into 4 subnets. Estimate the details of the subnetworks | 15 | 4 | 4 | 5 |
|  |  | 5. | Describe the UDP Socket Programming. | 15 | 6 | 6 | 3 |
|  |  | 6. | Distinguish between circuit switching and packet switching | 15 | 2 | 2 | 4 |
|  |  | 7. | Evaluate the role of firewalls in network security. Discuss the differences between packet-filtering, stateful, and application-layer firewalls, and provide examples of scenarios where each type is most effective | 15 | 5 | 5 | 3 |
|  |  | 8. | Analyze the security vulnerabilities associated with the File Transfer Protocol (FTP) and propose advanced security measures to mitigate these vulnerabilities in modern FTP implementations. | 15 | 5 | 5 | 3 |
|  |  | 9. | Compare and contrast SNMP (Simple Network Management Protocol) and HTTP (Hypertext Transfer Protocol) in terms of their applications and how they are used for managing network devices and services. | 15 | 5 | 5 | 4 |
|  |  | 10. | You receive a data message with a CRC value of 1010. After transmitting the message over a network, the CRC value at the receiver's end is calculated as 1110. Determine if there is an error in the received message. | 15 | 3 | 3 | 5 |
|  |  | 11. | In a selective repeat ARQ protocol, the sender sends a window of 10 frames, and the receiver has a buffer of 20 frames. If the sender sends frames 1 to 10, and frame 5 gets lost in transit, calculate the number of acknowledgments the receiver will send before it can successfully receive all frames. | 15 | 3 | 3 | 5 |
|  |  | 12. | Evaluate the effectiveness of the Token Bucket algorithm versus the Leaky Bucket algorithm in managing network traffic for different types of applications. Include scenarios where one might be more suitable than the other | 15 | 4 | 4 | 3 |
|  |  | 13. | How does the Token Bucket algorithm work to regulate traffic in a network, and what is its significance in Quality of Service (QoS) management? | 15 | 4 | 4 | 3 |
|  |  | 14. | Explain in detail about the DNS messages. | 15 | 5 | 5 | 3 |
|  |  | 15. | Explain the techniques to improve Quality of Service (QoS) | 15 | 5 | 5 | 3 |

**\* Please don’t add any column in the above table. However, you may add rows as per requirement.**