|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DIT UNIVERSITY, DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE)** | **: END TERM EXAMINATION, ODD SEM 2023-24 (SEM V)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Computer Networks** | | | | | | | | | | | | |

|  |  |
| --- | --- |
| **Time: 3 Hours** | **Total Marks: 100** |
| **Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the exam.**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  |  | | --- | --- | --- | | **Q.1)** | **Attempt all Parts :** | | |  | (a) | What is the difference among port address, logical address and physical address? Which layers of OSI model are responsible for providing these addresses respectively? | |  | (b) | Explain how does e-mail reaches to destination. Explain in brief SMTP | |  | (c) | Compare the window size, number of bits, used for numbering the frames and buffer size for the three ARQ techniques. | |  | (d) | Write the difference between IMAP and POP. Why they are uses? | |  |  | **[4 x 5= 20]** | |  | | | | **Q.2)** | **Attempt all Parts :** | | |  | (a) | Compare and contrast the stop and wait Protocol with sliding window protocol. | |  | (b) | How many cables will be required to arrange 15 nodes in a network using-  a) star topology b) mesh topology? | |  | (c) | If the data link layer provides the functionality of flow control at its level, why is it performed at transport layer level? Give appropriate reasoning to support you answer. | |  | (d) | What would be the transmitted frame? If the frame is 110101011 and generator is x4+x+1 | |  |  | **[4 x 5= 20]** | |  | | | | **Q.3)** | **Attempt any two parts :** | | |  | (a) | If the 7-bit Hamming code word received by the receiver is 1010010.Assuming the even parity, state whether the received code word is correct or wrong. If wrong, locate the bit in error. | |  | (b) | Consider a CSMA/CD network that transmits data at a rate of 100Mbps over 1Km cable with no repeaters. If the min. frame size required for this network is 1250 bytes. What is the signal speed (Km/sec.) and throughput in the cable? | |  | (c) | Explain congestion control, what are the limitation of leaky bucket algorithm, how they can be resolved. | |  |  | **[2 x 10= 20]** | |  | | | | **Q.4)** | **Attempt any two parts :** | | |  | (a) | What are the propagation time and the transmission time for a 2.5-kbyte message (an e-mail) if the bandwidth of the network is 2 Gbps? Assume that the distance between the sender and the receiver is 24,000 km and that light travels at 2.4 x 108 m/s. | |  | (b) | Illustrate the Scenarios for establishing a connection using a Three-Way Handshake. | |  | (c) | Explain the following with example-   1. Distance vector routing 2. Link state routing | |  |  | **[2 x 10= 20]** | |  | | | | **Q.5)** | **Attempt any two parts :** | | |  | (a) | A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces a. 1000 frames per second b. 500 frames per second c. 250 frames per second | |  | (b) | If IP Address =201.20.30.40, Calculate—   1. Network ID 2. 4th Host ID 3. Last Host ID 4. Broadcast Address | |  | (c) | A 3000 km long trunk operates at 1.536 Mbps and is used to transmit 64 byte frames and uses sliding window protocol. If the propagation speed is 6 μsec / km, how many bits should the sequence number field be? | |  |  | **[2 x 10= 20]** | | -----END OF PAPER ---- | | | | |