|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Q.1** |  | **Do as directed.** | | | | | **[12]** |
| CO2 | A | (a) | | What is sender’s window in case of selective repeat, go back n, and stop and wait protocol if the sequence number is 4 bits long? | | | [2] |
| CO1 | N | (b) | | How many bit(s) error can be detected and corrected by the octets: 0xFF, 0x47, 0x00 and 0x95? | | | [2] |
| CO1 | E | (c) | | The receiver receives code word 110010001. The generator polynomial is x3 + x + 1. Does the received data have an error? (show the procedure) | | | [2] |
| CO4 | A | (d) | | A supernet is created by combining some class C blocks. It has a first address of 205.16.32.0 and a supernet mask of 255.255.248.0. How many Class C blocks are there in this supernet? Explain. | | | [2] |
| CO2 | N | (e) | | An IPv4 packet has arrived with the first 8 bits as shown: 01000111...  How many bytes of options are being carried by this packet? Show your calculation. | | | [2] |
| CO4 | A | (f) | | Consider that Host H1 is connected to Host H2 via router R1 and router R2 as shown in figure below. Assign an IP address for all interfaces at all hosts and routers in the network. | | | [2] |
|  |  |  | |  | | |  |
| **Q.2** |  | Attempt ***Any TWO*** from the following questions. | | | | | **[12]** |
| CO3 | R | (a) | | What is error control? Where is it provided and where is it mandatory? What provisions are necessary for error detection? | | | [6] |
| CO3 | A | (b) | | The source has to send a message consisting of 13 frames to destination using go back n(sender’s window size=3). All frames are ready and immediately available for transmission. What is the number of frames that source will transmit for sending the message to destination in the following cases?  1. Every 5th frame that source transmits gets lost (but no acknowledgement is lost)  2. Every 4th frame that source transmits gets lost (but no acknowledgement is lost) | | | [6] |
| CO3 | U | (c) | | (i)If sender needs to send 10011000110 using Hamming code (with odd parity), what stream will be kept on the communication link?  (ii) If 11 network layer processes are involved in data transfer, how many routers are on the way? | | | [6] |
|  |  |  | |  | | |  |
| **Q.3** |  | **Answer the following questions.** | | | | | **[12]** |
| CO1 | N | (a) | Give details on:  1) Radio Transmission  2) Infrared and Millimeter Waves for communication | | **[4]** | | |
| CO4 | A | (b) | A router has the following CIDR entries in the routing table:   |  |  | | --- | --- | | **Address / mask** | **Next hop** | | 135.46.56.0/22 | Interface 0 | | 135.46.60.0/22 | Interface 1 | | 192.53.40.0/23 | Router 1 | | Default | Router 2 |   For each of the following IP addresses, what does the router do if a packet with that address arrives? Show your calculation.  **(i)**135.46.63.10 **(ii)**135.46.57.14 **(iii)**135.46.52.2 **(iv)**192.53.56.7 **(v)**192.53.40.7 | | | **[6]** | |
| CO2 | E | (c) | Determine if a datagram with the following information is - a first fragment, a middle fragment, a last fragment, or the only fragment (no fragmentation). Justify your answer.  • M bit is set to 1 and the value of the offset field is zero.  • M bit is set to 0 and the value of the offset field is nonzero. | | | **[2]** | |
|  |  |  | **OR** | | |  | |
| **Q.3** |  |  | **Answer the following questions.** | | | **[12]** | |
| CO4 | A | (a) | Assume a company has three offices: Sales, Finance and Operations. The company is granted a block with the beginning address 223.1.17.0/24. Also suppose that Sales office is required to support up to 124 different hosts, and Finance office is required to support up to 31 different hosts and Operations office is required to support up to 60 different hosts.   1. Determine the number of addresses assigned to each office. 2. Find the subnet mask for each office. 3. First and the last address of the block allocated to each office. | | | **[6]** | |
| CO1 | N | (b) | Compare the OSI and TCP/IP Reference Models. | | | **[4]** | |
| CO2 | E | (c) | What is the transparent fragmentation? What are the disadvantages of it? | | | **[2]** | |
|  |  |  |  | | |  | |