

Roll No.:.....

# National Institute of Technology, Delhi

Name of the Examination: B.Tech.

Mid Semester Examination (Spring, 2023)

Branch : ECE

Semester : ~~V~~ VI

Title of the Course : Computer Networks

Course Code : CSB 342

Time: 1 Hour 30 Minutes

Maximum Marks: 25

Note: All questions are compulsory.

COURSE OUTCOMES		COGNITIVE LEVELS
CO1	Defining the basics of networking, delay components and underlying technologies.	<b>Understanding</b> (Level II)
CO2	Examine various computer communication protocols and its performance enhancing mechanisms.	<b>Analyzing</b> (Level IV)
CO3	Determine the shortest path for the network using various routing protocols and evaluate it.	<b>Evaluating</b> (Level V)
CO4	Choose IP & MAC addressing mechanisms and data link layer protocols to solve communication, error detection, and correction problems.	<b>Applying</b> (Level III)

Course Outcomes (CO's)	CO1	CO2	CO4
Questions No.	Q2, Q3	Q4, Q5	Q1

Answer the following questions.

Q1. Let the IP address of one of the hosts (computer) in the network be 199.68.89.139. The subnet mask is 255.255.255.224. Calculate [5]

1. Subnet ID.
2. IP address of the first host in the subnet.
3. IP address of the last host in the subnet.
4. Direct broadcast address (DBA of subnet)
5. Loopback address

Q2. 1. What is the difference between bit and baud rates? [2+3]

2. If the baud rate over a channel is 4800 bauds/s, and there are 8 different symbols possible. What is the minimum bit rate possible for such transmission?

Q3. How many broadcast and collision domains exist in the following network if [1+2+2]

- I. X is a hub.
- II. X is a switch.

III. X is a router.

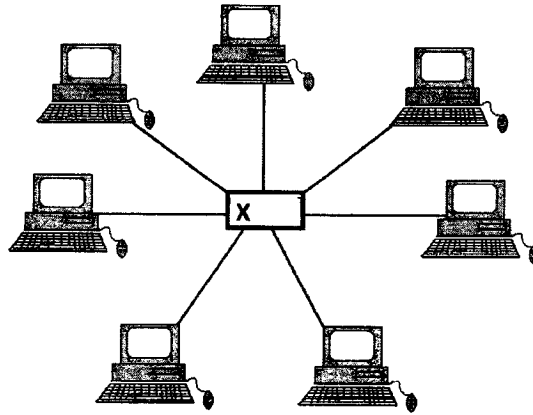


Fig. 1

**Q4**

1. Consider an arbitrary layered architecture with  $N$  layers. If  $m$  is the length of the original message that should be transmitted and  $H$  is the header added at every layer. Calculate the fraction of data in the whole content that is transmitted. [2+3]
2. Fill in the blank
  - a. \_\_\_\_\_ layer controls for flow and error controls
  - b. \_\_\_\_\_ layer control protocols responsible for bit-by-bit delivery of information.

**Q5.**

For Go back N ARQ protocol

[2+2+1]

1. Let a 6-bit sequence number be used to represent a frame. In such a scenario, what would be the maximum sender window size and the receiver window size?
2. If the maximum sender window size is  $N$ , calculate the number of sequence bits.
3. What is the disadvantage of the above protocol?