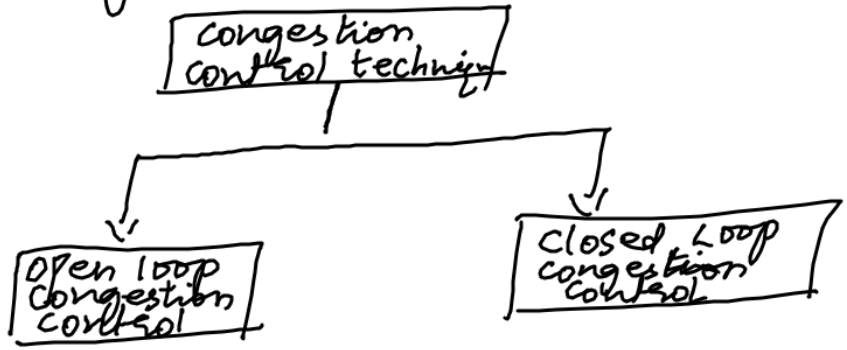
Q) What is congestion? Explain congestion control techniques?

Ans:- **Congestion:** Congestion is a situation in a network. The congestion takes place when the number of packets sent to the network is greater than the capacity of the network.

Congestion control: The congestion control is the technique used for preventing or controlling congestion.



✓ open Loop congestion control:

* These techniques are used to prevent congestion before it happens.

(i) **Retransmission Policy:**

. This policy is used to control retransmission of packets.

. Generally, a sender retransmit the packet if he feels that the packet is lost or corrupted.

. This retransmission may create congestion in the network.

. To prevent congestion, a timer must be designed.

(ii) **Window Policy:** There are two types of windows that can be used at sender side: "Go-back-n window" and "Selective Repeat window". In Go-back-n window, the packets are resent which may be duplicates. where as in Selective Repeat Window only sends lost packets.

(iii) Discarding policy: In this policy, a router can discard the packet. A good discard policy can prevent congestion control.

(iv) Acknowledgement policy: The acknowledgement policy can also create congestion. For example, if the receiver sends acknowledgement for N packets rather than 1 packet then we can prevent congestion.

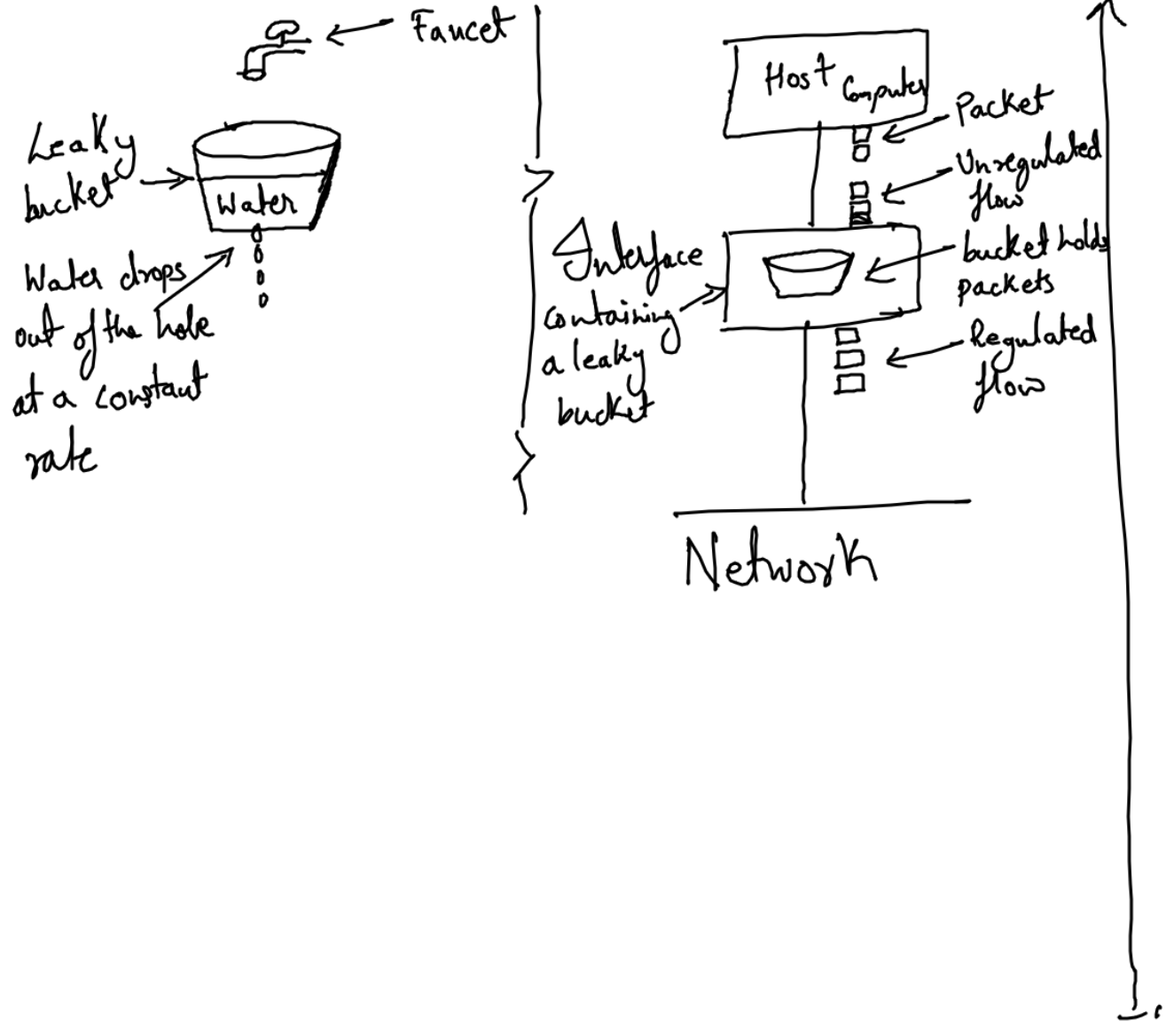
✓ Closed Loop Congestion Control:
These techniques are used to control congestion after it happens

(i) Backpressure:

(Q) Explain various congestion control algorithms?

Ans:- Leaky Bucket Algorithm:

✓ Leaky Bucket Algorithm is used to control congestion.
✓ Leaky Bucket is a Bucket with a hole at bottom.
✓ Flow of water from bucket is at a constant rate.
✓ If bucket is full, any additional water entering the bucket is thrown out.
⇒ Same technique is applied to control congestion.
- Every host in the network has a buffer (bucket) which is a queue.
- when host wants to send a packet, packet is sent to buffer.
- The buffer transmits packets at a constant rate.
- Bursty traffic is converted to uniform traffic.


Faucet
Leaky bucket
Water
Water drops out of the hole at a constant rate
Host Computer
Packet
Unregulated flow
Interface containing a leaky bucket
bucket holds packets
Regulated flow
Network