5/5 Completed 05/04/23

NAME: PRERNA JADHAV
COURSE: COMPUTER NETWORKS
SAPID: 60004220127

ASSIGNMENT -I

Q1 Suppose you wanted to set up a LAN based computer lab in your organisation / institute. Indentify the requirements. Explain all the components involved with their specification List all the assumptions.

soln Setting up LAN based computer lab ~~bein~~ requires careful planning and consideration of various components to ensure that the lab runs efficiently and meets the needs of the organization.

→ Requirement:

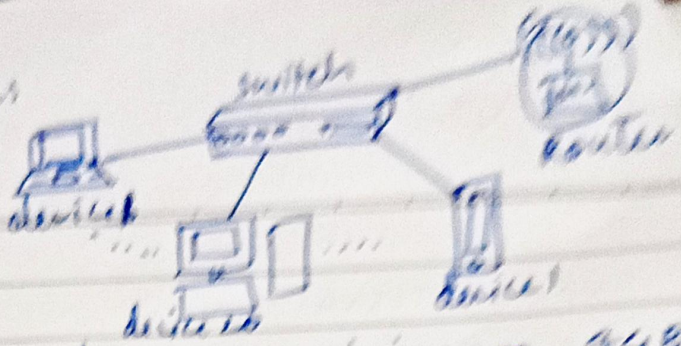
Space: A room with sufficient space & good ventilation

Power: Adequate power supply to ensure that all the computers can be powered.

Network connectivity: A high speed network connection is essential for a LAN-based computer lab. The network should be capable of handling the traffic generated by the lab

Computer: Sufficient computers with suitable speficications & softwares to meet the need of the users.

Diagram:




→ Components:
Computers: They should have minimum 4GB of RAM, 500 GB hard disk & a decent processor.
Operating system: compatible licensed OS.
Peripherals: keyboard, monitor mice etc.
Networking equipments: switches, routers, network cables to connect.

→ Assumptions:
The lab is for general purpose usage & has technical support to handle any issues that arise.

Q2 A university campus has multiple buildings in a ~~~~ that needs to be connected to each other via a wired network. what types of cables might be used for this network, & how would the physical layer be configured to ensure reliable data transmission.

→ The most common cables are twisted pair cables, fiber optic, coaxial cables etc.

→ To ensure the reliable transmission, here are some steps to be taken:-
- Choose appropriate cable type based on the distance & bandwidth requirement.
- Terminate the cables properly to ensure a good connection
- Use repeaters or switches to boost the

signal strength and prevent signal degradation over longer distance.

- Use appropriate connector & adapters to ensure a good connection.
- Test the cables regularly to detect any faults or issues.

Q3

(i) Suppose a sender wants to transmit the message 1101011 using CRC. The generator polynomial is $x^3 + x + 1$. Calculate the resulting CRC and the transmitted message.

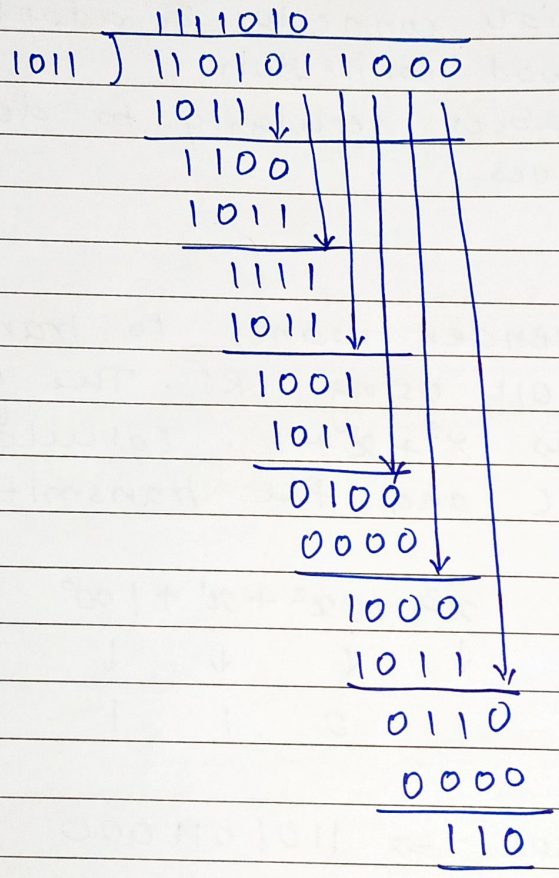
CRC generator $x^3 + 0x^2 + x^1 + 1x^0$

↓ ↓ ↓ ↓

1 0 1 1 → $n = 4$

Append (n-1) zeros ⇒ 1101011000

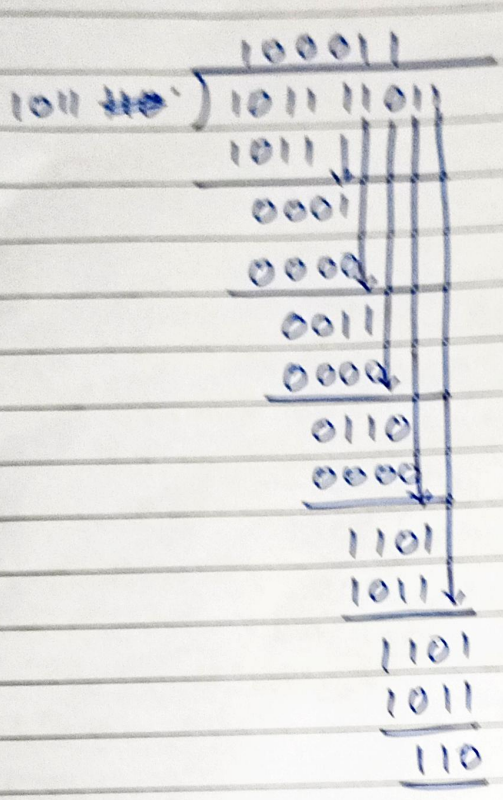
Divide 1011 by the message




Transmitted message :- 1101011110

CRC :- 110

ii) Received message :- 10111011
Polynomial generator :- 1011




Here the remainder is ≠ non zero so there is some error in the msg transmitted