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Question No. 1:

(a): Name different network topologies? And cite an advantage of each type:

Network Topology

It is the arrangement of the many elements (links, nodes, etc.) of a computer network.

There are five types of topology in computer

 i. **Star topology**

 ii. **Mesh topology**

 iii. **Bus topology**

 iv. **Ring topology**

 v. **Hybrid topology**

Advantages Star topology:

   a. Easy to install and wire

   b. No disruptions to the network when connecting and removing devices

   c. Easy to detect faults and to remove parts.

Advantages Mesh topology:

   a. Each connection can care its own data load

   b. It is robust

   c. A fault is diagnosed easily

   d. Provide security and privacy

Advantages Ring topology:

a. All data flows in one direction reducing the chance of packets collisions

b. Easier to manage; easier to locate a defective node or cable problem

c. Handles high-volume network traffic

d. Enables reliable communication

e. A network server is not needed to control network connectivity between each work station.

Hybrid topology

a. Can be modified as per requirement

b. It is extremely flexible.

c. It is very reliable.

d. It is easily scalable

Advantages Bus topology

a. Relatively inexpensive to implement

b. Easy to install and use.

c. Cables are less used then star or ring topology.

(b) What is the difference between a Physical address, Logical address and Port Address?

❖ **Logical Address:**

An IP address of the system is called logical address. This address is the combination of Net ID and Host ID. This address is used by network layer to identify a particular network (source to destination) among the networks. This address can be changed by changing the host position on the network. So it is called logical address.

❖ **Physical address**:

Each system having a NIC(Network Interface Card) through which two systems kphysically connected with each other with cables. The address of the NIC is called Physical address or mac address. This is specified by the manufacturer company of the card. This address is used by data link layer.

❖ **Port Address**:

IP address and physical address are necessary for a data to travel from source to destination

Port address determines which services in destination host should data be delivered

port address is a 16-bit address represented by one decimal number Data Communication - Network Models

(c): How OSI and ISO are related to each other?

Introduction

Established in 1947

ISO stand for International Standard Organization

Multinational body dedicated to worldwide agreement

Standard of international level

Covers all aspects of network communications

OSI

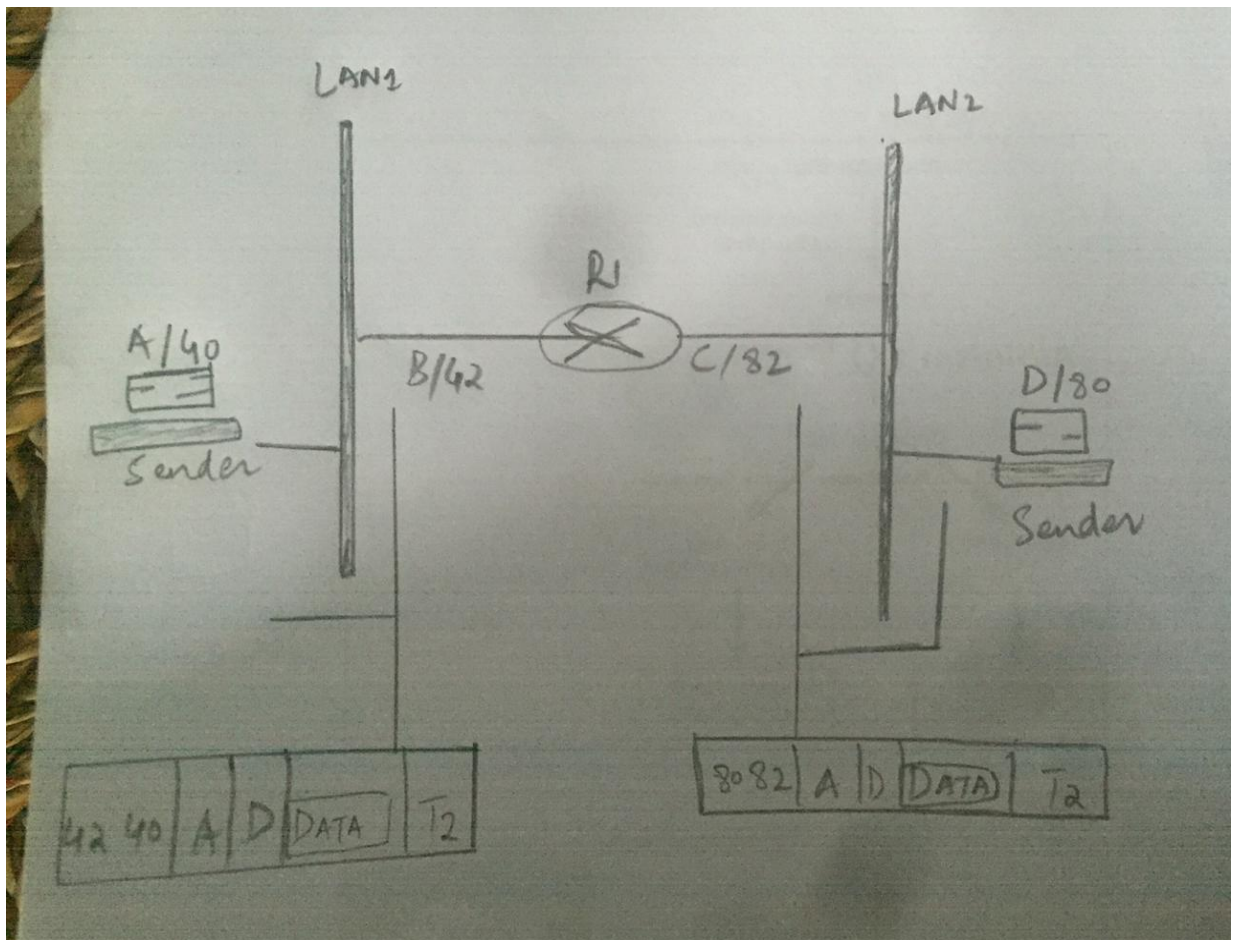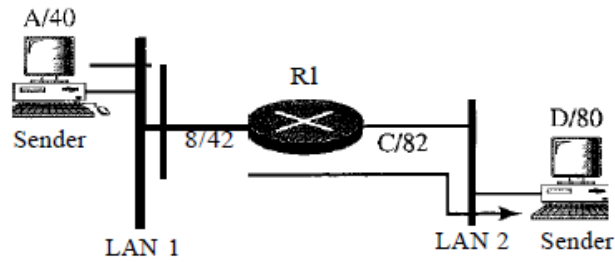It is Open System Interconnection MODEL

Allow two different Machines to connect without change in hardware and software

It is model for understanding and designing a network architecture

The ISO-OSI model is a seven layer architecture. It defines seven layers or levels in a complete communication system. They are:

1. Application Layer
2. Presentation Layer
3. Session Layer
4. Transport Layer
5. Network Layer
6. Data-link Layer
7. Physical Layer

Question No. (a): For figure below, computer A sends a message to computer D via LAN 1, router R1, and LAN 2. Assume that the communication is between a process running at computer A with port address *i* and a process running at computer D with port address *j*. Show the contents of the Packets and Frames at the network, data link and transport layer for each hop interface. **(15)**

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