VASAVI COLLEGE OF ENGINEERING

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DEPARTMENT OF : ECE

NAME OF THE LABORATORY : Computer Networks

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Introduction to Networks

Networks play a crucial role in modern society, influencing how we communicate, work, and access information. At its core, networking involves the interconnectedness of devices and systems to facilitate data exchange and collaboration.

Understanding Network Components:-
To comprehend the functioning of networks, it's essential to understand the various components involved. Hosts, such as computers, smartphones, and servers, generate and consume data, while network devices, including routers, switches, and firewalls, facilitate the transmission of data between hosts. These components work together to ensure efficient communication within the network.

Exploring Network Representations and Topologies:-
Visual representations, such as diagrams and models, provide insights into the structure and layout of network. Network representations aid in designing and implementing network topologies, which define the physical or logical arrangement of network devices and connections. Common topologies include bus, star, ring and mesh configurations.

Diving into Network Types:-
Various types of networks cater to specific requirements and environments. Local Area Networks (LANs) serve small geographical areas, while Wide Area Networks (WANs) span larger distances, connecting LANs across cities or countries. Additionally, MAN and PAN address specialized needs, such as city-wide connectivity.

Understanding Internet Connectivity:-
The interconnection of LANs and WANs to the internet is facilitated through routers, gateways, and other networking devices. This interconnectedness enables users to access and share resources, services, and information available on the internet, fostering collaboration

Ensuring Network Reliability and security:-
Reliable networks must meet fundamental requirements, including availability, reliability, scalability and security. Availability ensures uninterrupted access to network services, while reliability guarantees consistent performance and uptime. Scalability allows for the expansion of network resources to accommodate growth, while security measures protect against unauthorized access, data breaches and other threats.

Embracing Network Trends:-

Emerging trends such as Bring Your Own Device (BYOD), Online collaboration, video streaming, and cloud computing are reshaping the networking landscape. These trends emphasize mobility, flexibility, and efficiency, driving innovation and transformation in networking technologies and practices

Exploring Career Opportunities:-

The field of networking offers diverse career opportunities for IT professionals with skills in network design, implementation, administration, and security.

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Introduction to CISCO Packet Tracer

The CISCO packet tracer was developed by the CISCO company. It is a type of tool that provides the simulator to practice simple and complex networks.

The main purpose of the CISCO packet tracer is to help the student for the purpose of learning hand on experience in networking. It also provides specific skills for CISCO technology. This tool cannot replace the router or switch because this software has some inbuilt protocol. The interesting thing is that this device has not only the CISCO product but also it has some inbuilt networking support.

This packet also helps the student to complete their assignment by working on their own or working with a team. It also helps the engineer to test their application before implementing them. Also, the engineers who work on network support can also deploy ~~can~~ any changes. also use the CISCO packet with the help of this packet tracer, it is very easier for all the engineers to add or remove any simulated network devices. We can perform these operations in two steps. One is drag and drop user interface, and another is the command line interface.

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Difference between Modem and Router

Functionality	Modem	Router
Layer	Data link layer	Network layer
Scope	Extends service provider network over layer 2 till customer premises	Routes between customer LAN and service provider network.
Ports	One for connection to ISP. Next one to connect with router	2/4/8
Data Transmission from	Packet	Packet
Device type	Inter networking device	Networking device
Connections	Can connect to one PC using Ethernet port	Can connect to multiple PCs or networking devices via Ethernet or WIFI
Intelligence	Upto layer 2 only	Upto layer 3 and 4
Primary function	converts analog signals to digital data	Connects multiple devices to a network

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Feature	Modem	Router
Role in Internet	connects home to the Internet (I.S.P)	Distributes internet within the home
Connection type	wired (coaxial, telephone line)	(wired and wireless (ethernet and wifi)
Device link	Direct link to one device (usually PC)	Links multiple devices simultaneously
IP address	Provides single public IP address	Assigns local IP addresses to devices
Security	Basic primarily on the ISP's side	Enhanced with firewalls and encryption
Network type	Wide Area Network (WAN)	Local area network (LAN) and wifi
User management	limited to none	Advanced settings (Parental controls, etc)