Assignment 2:

Data communication

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1. What are the different types of networks?

ANS:-

- **Local Area Network (LAN) :-**

A local area network (LAN) is a collection of devices connected together in one physical location, such as a building, office, or home. ... In contrast, a wide area network (WAN) or metropolitan area network (MAN) covers larger geographic areas. Some WANs and MANs connect many LANs together

- **Metropolitan Area Network (MAN):-**

A metropolitan area network, or MAN, connects multiple LANs across a large area but is smaller than a WAN. Learn how MAN networks work

- **Wide Area Network (WAN) :-**

A wide area network (WAN) is a telecommunications network that extends over a large geographic area for the primary purpose of computer networking. Wide area networks are often established with leased telecommunication circuits.

2. Explain the Shielded twisted pair (STP) and Unshielded twisted pair(UTP)

ANS:-

UTP	STP
UTP stands for Unshielded twisted pair.	**STP stands for Shielded twisted pair.**
In UTP grounding cable is not necessary.	**While in STP grounding cable is required.**
Data rate in UTP is slow compared to STP.	**Data rate in STP is high.**
The cost of UTP is less.	**While STP is costlier than UTP.**
In UTP much more maintenance are not needed.	**While in STP much more maintenance are needed.**

In UTP noise is high compared to STP.	**While in STP noise is less.**
In UTP the generation of crosstalk is also high compared to STP.	**While in STP generation of crosstalk is also less.**
In UTP, attenuation is high in comparison to STP.	**While in STP attenuation is low.**

3. What is difference between baseband and broadband transmission?

ANS:-

Baseband Transmission	Broadband Transmission
In baseband transmission, the type of signalling used is digital.	**In broadband transmission, the type of signalling used is analog.**
Baseband Transmission is bidirectional in nature.	**Broadband Transmission is unidirectional in nature.**
Signals can only travel over short distances.	**Signals can be travelled over long distances without being attenuated.**
It works well with bus topology.	**It is used with a bus as well as tree topology.**
In baseband transmission, Manchester and Differential Manchester encoding are used.	**Only PSK encoding is**

4.What is the difference between a hub, modem, router and a switch?

ANS:-

Hub

A hub is to sent out a message from one port to other ports. For example, if there are three computers of A, B, C, the message sent by a hub for computer A

will also come to the other computers. But only computer A will respond and the response will also go out to every other port on the hub. Therefore, all the computers can receive the message and computers themselves need to decide whether to accept the message.

Switch

A switch is able to handle the data and knows the specific addresses to send the message. It can decide which computer is the message intended for and send the message directly to the right computer. The efficiency of switch has been greatly improved, thus providing a faster network speed.

Router

Router is actually a small computer that can be programmed to handle and route the network traffic. It usually connects at least two networks together, such as two LANs, two WANs or a LAN and its ISP network. Routers can calculate the best route for sending data and communicate with each other by protocols.

5. When you move the NIC cards from one PC to another PC, does the MAC address gets transferred as well?

   ANS:-

Yes, that's because MAC addresses are hard-wired into the NIC circuitry, not the PC. This also means that a PC can have a different MAC address when the NIC card was replace by another one.

6. When troubleshooting computer network problems, what common hardware-related problems can occur?

ANS:-

A large percentage of a network is made up of hardware. Problems in these areas can range from malfunctioning hard drives, broken NICs and even hardware startups.

7. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?

ANS:-

The best solution is to install anti-virus on all the computers in the network. This will protect each device from the other in case some malicious user tries to insert a virus into the servers or legitimate users.

8.Define Static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6.

ANS:-

Static IP:-

- **It is provided by ISP(Internet Service Provider)**
- **Static ip address does not change any time, it means if a static ip address is provided then it can't be changed or modified.**
- **Static ip address is less secure.**

Dynamic IP:-

- **While it is provided by DHCP (Dynamic Host Configuration Protocol).**
- **While dynamic ip address change any time.**
- **While in dynamic ip address, there is low amount of risk than static ip address's risk.**

IPv4	IPv6
IPv4 is a 32-Bit IP Address.	IPv6 is 128 Bit IP Address.
IPv4 is a numeric address, and its binary bits are separated by a dot (.)	IPv6 is an alphanumeric address whose binary bits are separated by a colon (:). It also contains hexadecimal.
12	8
20	40
Has checksum fields	Does not have checksum fields
12.244.233.165	2001:0db8:0000:0000:0000:ff00:0042:7879
Unicast, broadcast, and multicast.	Unicast, multicast, and anycast.
IPv4 offers five different classes of IP Address. Class A to E.	IPv6 allows storing an unlimited number of IP Address.
You have to configure a newly installed system before it can communicate with other systems.	In IPv6, the configuration is optional, depending upon on functions needed.

9.Discuss TCP/IP model in detail.

ANS:-

- **The TCP/IP model was developed prior to the OSI model.**
- **The TCP/IP model is not exactly similar to the OSI model.**
- **The TCP/IP model consists of five layers: the application layer, transport layer, network layer, data link layer and physical layer.**
- **The first four layers provide physical standards, network interface, internetworking, and transport functions that correspond to the first four layers of the OSI model and these four layers are represented in TCP/IP model by a single layer called the application layer.**
- **TCP/IP is a hierarchical protocol made up of interactive modules, and each of them provides specific functionality.**

10. What is a Web Browser (Browser)? Give some example of browsers.

ANS:-

A software application used to access information on the World Wide Web is called a Web Browser. When a user requests some information, the web browser fetches the data from a web server and then displays the webpage on the user's screen.

Example of browsers:-

The most popular web browsers are Google Chrome, Microsoft Edge (formerly Internet Explorer), Mozilla Firefox, and Apple's Safari. If you have a Windows computer, Microsoft Edge (or its older counterpart, Internet Explorer) are already installed on your computer.

11. What is a search engine? Give example.

ANS:-

A search engine is a web-based tool that enables users to locate information on the World Wide Web. Popular examples of search engines are Google, Yahoo!, and MSN Search. Search engines utilize automated software applications (referred to as robots, bots, or spiders) that travel along the Web, following links from page to page, site to site. The information gathered by the spiders is used to create a searchable index of the Web.

Example of SE:-

Google Search Engine is the best search engine in the world and it is also one of most popular products from Google. Almost 70 percent of the Search Engine market has been acquired by Google. The tech giant is always evolving and looking to improve the search engine algorithm to provide best results to the end-user. Although Google appears to be the biggest search engine, as of 2015 YouTube is now more popular than Google (on desktop computers).

12. What is the Internet & WWW? What are the uses of internet in our daily life?

ANS:-

The world wide web, or web for short, are the pages you see when you're at a device and you're online. But the internet is the network of connected computers that the web works on, as well as what emails and files travel across. ... The world wide web contains the things you see on the roads like houses and shops.

1. User of internet in Education :-

The Internet is a great platform for students to learn throughout their lifetime. They can use the internet to learn new things and even acquire degrees through online education programs. Teachers can also use the internet to teach students around the world.

2. Internet Use to Speed Up Daily Tasks:-

The Internet is very much useful in our daily routine tasks. For example, it helps us to see our notifications and emails. Apart from this, people can use the internet for money transfers, shopping order online food, etc.

3. Use of the Internet for Shopping:-

With the help of the internet, anybody can order products online. The increase in online shopping has also resulted in companies offering a huge discount for their customers.

4. Internet for Research & Development:-

The Internet plays a pivotal role in research and development as it is propelled through internet research. The benefit of the internet is enjoyed by small businessmen to big universities.

5. Business Promotion and Innovation:-

The Internet is also used to sell products by using various e-Commerce solutions. The result is new services and businesses starting every day thereby creating job opportunities and reducing unemployment.

6. Communication:-

Without a doubt, the internet is the most powerful medium of communication at present. It connects people across different parts of the world free and fast.

7. Digital Transactions:-

The internet facilitates internet banking, mobile banking, and e-wallets. Since all digital transactions are stored in a database, it helps the government to track income tax details or income reports in the ITR.

8. Money Management:-

The internet can also be used to manage money. Now, there are many websites, applications, and other tools that help us in daily transactions, transfers, management, budget, etc.

9. Tour & Travel:-

During tour and travel, the use of the internet is highly effective as it serves as a guide. People browse the internet before they start visiting the places. Tour bookings can also be done using the internet.

The influence of the internet in our daily life is huge. It has opened us a magical world of information and we would have never seen the world as it is without the internet. Considering its scope and importance, it would be hard to imagine a world without the internet

13. What is an Internet Service Provider? Give some example of ISP in India.

ANS:-

An Internet service provider (ISP) is an organization that provides many different services for accessing, using, or participating in the Internet. Internet services typically provided by ISPs can include Internet access, Internet transit, domain name registration, web hosting, Usenet service, and co-location.

Example of ISP:-

An Internet Service Provider (ISP) is a company such as AT&T, Verizon, Comcast, or Spectrum that provides Internet access to companies, families, and even mobile users. ISPs use fiber-optics, satellite, copper wire, and other forms to provide Internet access to its customers.

14. Discuss the difference between MAC address, IP address and Port address.

ANS:-

IP address :-

An Internet Protocol address (IP address) is the logical address of our network hardware by which other devices identify it in a network. IP address stands for Internet Protocol address which is an unique number or a numerical representation that uniquely identifies a specific interface on the network. Each device that is connected to internet an IP address is assigned to it for its unique identification.

Addresses in IPv4 are 32-bits long example,

12.244.233.165

Port address :-

Port number is the part of the addressing information used to identify the senders and receivers of messages in computer networking. Different port numbers are used to determine what protocol incoming traffic should be directed to. Port number identifies a specific process to which an Internet or other network message is to be forwarded when it arrives at a server. Ports are identified for each protocol and It is considered as a communication endpoint.

Ports are represented by 16-bit numbers. 0 to 1023 are restricted port numbers are as they are used by well-known protocol services. 1024 to 49151 are registered port numbers means it can be registered to specific protocols by software corporations and in last 49152 to 65536 are used as private ports means they can be used by anybody.

15. How do we view my Internet browser's history?

ANS:-

all major browsers have functionality that allows you to quickly and easily view your Internet browser's history. However, as multiple devices contain browser history, there are multiple ways to view as well. To proceed, choose your devices from the section below and follow the instructions.

Desktop or laptop computer

If you are using Windows, Linux, or macOS, there are quick shortcut key combinations that allow you to view your history.

Windows and Linux users: ctrl+H

Apple users: Command + shift + H

Android phone or tablet running Google Chrome

Once one of the above shortcut keys is pressed, a history section similar to the example below should appear. In the following screenshot, browsing history is being viewed in Google Chrome

Users who are running Google Chrome on their Android phone or tablet can view their history with the following steps.

1. **Open the Google chrome Internet browser.**
2. **In the upper-right corner of the screen tap the**  **icon.**
3. **In the drop-down menu that appears, select history and shown in the image.**
4. **The following page contains your device's history.**

iPhone or iPad running Safari

Users who are running Safari for iOS on their iPhone or iPad can view their history with the following steps.

1. **On your device, open the Safari Internet browser.**
2. **In the lower-left corner of the browser window, press and hold the back arrow.**
3. **The next screen contains your browser's history.**