Assignment-2

CCA 102
DATA
COMMUNICATIONS

BY
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Declaration

I **sraddha choudhary Registration no: CCA/2021/85963 (CSC id** – 272443730011) hereby declare that the assignment submitted on the entitled "**Data Communication**" is a bonfires work done by me.

QUESTION - 01

What are the different types of Network ?

ANSWER :-

NETWORK :-

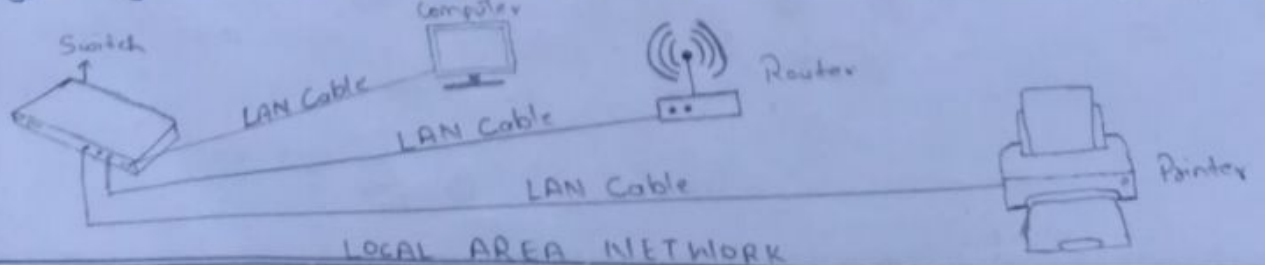
A Network is a Set of devices (often referred to as nodes) connected by communication link to share computing resources. A nodes can be a computer, printer, Smart phone, refrigerator car or any other device capable of Sending and / or receiving data generated by other node on the Network.

TYPES of NETWORK :-

There are Various types of Network Some of them are
1. local area Network (LAN)
2. Wide area Network (WAN)
3. Wireless Local area Network (WLAN)

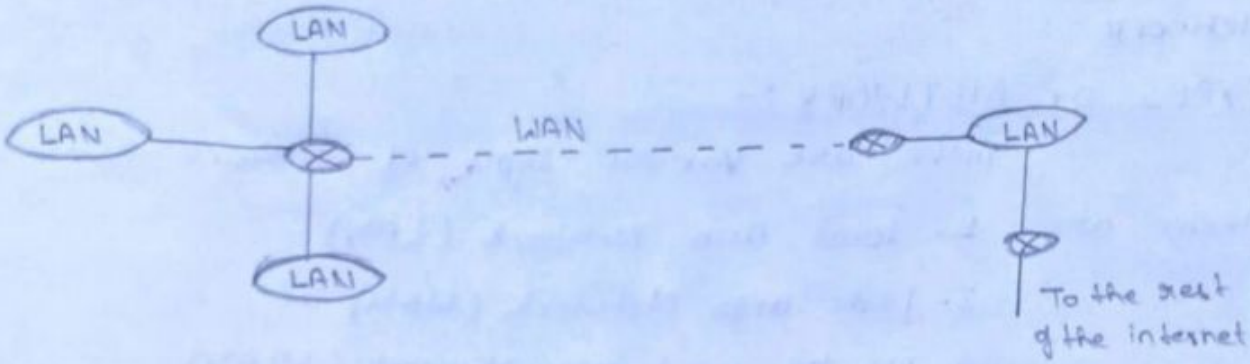
1. LOCAL AREA NETWORK :-

A local area Network is usually privately owned and links the devices in a Single office, building or Campus. Local area network are designed to allow resources to be Shared between personal Computer or workStations. The resources to be Shared can include hardware, Software, or data. LAN's are distinguished from other types of Network by their transmission media and topology.



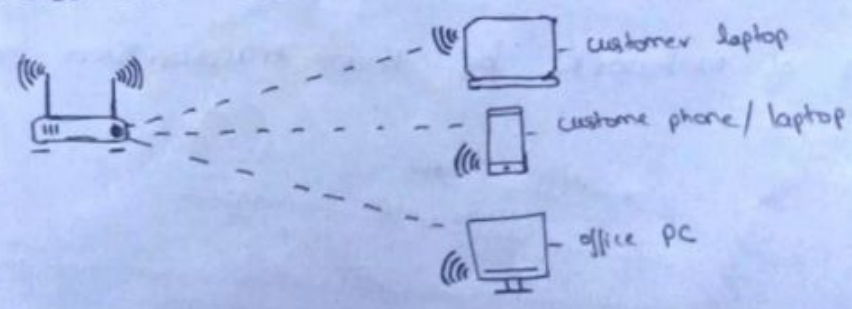
WIDE AREA NETWORK :-

A Wide area Network provides long distance transmission of data image audio and video information over large geographical area that may comprise a country, a continent, or even the whole world. A WAN can be as complex as the backbone that connect the internet as or as simple as a dial up line that connect a home computer to the internet. We normally refer to the first Switch as a Switched WAN and to the Second as a point to point WAN.



WIRELESS LOCAL AREA NETWORK :-

A Wireless local area Network is a wireless computer network that links two or more devices using wireless communication to form a local area network with in a limited area such as a home, school, computer laboratory campus or office building. It provide wireless network communication over short distance using radio or infrared Signal instead of traditional network cable.



QUESTION- 02

Explain the Shielded twisted paid (STD) and Unshielded twisted pair (UTP)

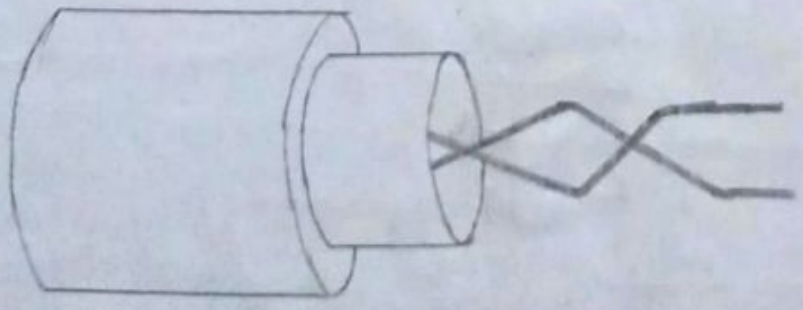
ANSWER:-

SHIELDED TWISTED PAIR :-

Shielded twisted pair (STP) cable was originally designed by IBM for token ring network that include two individuals wires covered with a foil shielding which prevents electromagnetic interference, there by transporting data faster.

STP is similar to unshielded twisted pair (UTP) however, it contain an extra for wrapping or copper braid jacket to help shield the cable signal from interference. STP cable are costlier when compared to UTP but has the advantage of being capable of supporting higher transmission rates across the longer distance.

SHIELDED TWISTED PAIR.

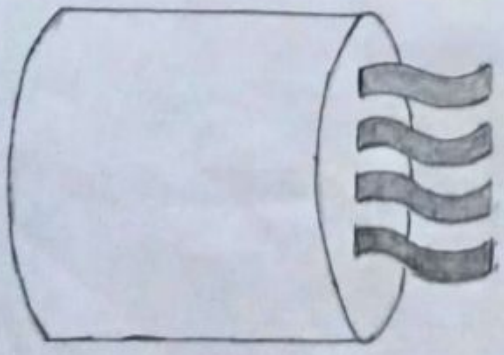


UNSHIELDED TWISTED PAIR :-

Unshielded twisted pair (UTP) cable are widely used in the computer and telecommunications industry as ethernet cable and telephones wes. In an UTP cable conductor which form a single circute are twisted around each other in order to cancel out electromagnetic interference (EMI) from entered sources. unshielded means no additional shielded like meshes or aluminium foil. which aild bulk are used.

UTP Cable are often groups of twisted pairs grouped together with color coded insulator, the number of which depends on the purpose. An UTP cable is made up of a bundle of twisted pairs The twisted pairs are small 22 - or 24 American wire guage (AWG) sized wires twisted around each other.

UNSHIELDED TWISTED PAIR



QUESTION-03

What is difference between baseband and broadband transmission?

ANSWER:-

BASEBAND:-

It is a digital signal is transmitted on the medium using one of the signal codes like NRZ, RZ Manchester biphase-M code etc is called base band transmission.

BROADBAND:-

Broadband system use modulation techniques to reduce the effect of noise in the environment. Broadband transmission employs multiple channel unidirectional transmission using combination of phase and amplitude modulation.

Difference between baseband and broadband transmission:-

factor	Baseband.	Broadband
The signal used for the transmission	The baseband transmits the digital signal using the physical medium like wires.	The broadband transmits the analog signals using optical fibres and twisted cable as a medium of transmission.
Transmission direction	The baseband signaling is termed as bidirectional and is capable of sending digital signal in both directions.	The broadband signalling is termed as bidirectional and is capable of sending digital signals in only one direction.

Encoding Scheme used.	The baseband signaling used Manchester encoding Scheme while transmitting the digital Signal.	The broadband Signalling used Manchester encoding Scheme while transmitting the analog Signal.
Range of Signals	The baseband transmission can transmit the digital signal over a short distance only when compared to broadband transmission	The broadband transmission can transmit the analog Signal over a long distance compared to baseband transmission.
Typology used.	The baseband transmission uses the bus typology as the application.	The broadband transmission uses the tree and bus typology as the application.
Medium of Transfer.	The baseband signals used twisted pair cables, coaxial cables and wires as a medium of transmitting digital Signals.	The broadband signals are used optical fiber cable coaxial cable and radio wave to transmit analog Signal.
Application.	The baseband transmission is mostly used for the LAN network as the baseband Signalling can transmit the digital signal for a short distance only and there is requirement of repeater for transmitting the Signals.	Broadband transmission is mostly used for telephone network. The broadband Signalling can transmit the analog Signals for a long distance. without using any external device like repeater.

QUESTION-04

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

ANSWER:-

HUB:-

A Network hub is a node that broadcasts data to every computer or ethernet-based device connected to it Hub cannot provide routing capabilities or other advanced network services. Because they operate by forwarding packets across all port indiscriminately network hub are sometime referred to as "dumb switches."

MODEM:-

Modem is a device that enables a computer to send or receive data over telephone or cable line. The Modulator converts digital data into analog data when the data is being sent by the computer.

ROUTER:-

A router is a networking device that forwards data packet between computer networks. Router perform the traffic directing functions on the internet. Data sent through the internet such as a web page or email, is in the form of data packets.

SWITCH:-

A Switch is a device in a computer network that connect other devices together. Multiple data cable are plugged into a Switch to enable communication between

different networked devices.

Difference between hub, modem, router and a switch.

Device	Hub	Modem	Router	Switch
use	Connect a network of personal computers together so they can be joined through a central hub.	Modems like routers connect home PC's to the internet.	Joins multiple area network serving as "middle man" or intermediate destination for network traffic	Join several computers within one local area network They cannot join multiple network, and are incapable of sharing an internet connection
function	Broad caste data, does not select where the data goes but rather send it to every destination.	Code and decode data so that it can pass between home network and internet service provider. Modem brings in the information while the router distributes it to the devices.	Creat a home network, where all home computers are connected equall to the router where there is no hierarchy in performance. protect from viruses	A home network with a switch must designate one computer as the gateway to the internet connect multiple computer together with in one local network.
Network	LAN	-	LAN & WAN	LAN
Sophistication level	low	High	High	medium.

QUESTION-05

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

ANSWER:-

Yes. The Given statment is correct when we move the NIC card from one PC to another PC the MAC address also get tranfer as well, that's because MAC address are hard-wired into the NIC circuitry, not the PC. This also means that a PC can have a different MAC address when another one replaced the NIC card.

QUESTION-06

When troubleshooting computer network problems, what common hardware related problems can occure?

ANISWER:-

A large percentage of a network is made up of hardware. Problems in these area can range from malfonction hard drives, broken NIC's and even hardware hard ware start ups.

Incorrect hardware configuration is also one of those culprit to look into. Such as the trouble-shooting comes from cable we also have to check the LAN DRIVER has been installed.

QUESTION-07

In a Network that contain two servers and twenty workstations. where is the best place to hstall an Anti-virus program?

ANSWER:-

An Anti-Virus program must be installed on all Servers and workstations to ensure protection. That's because individual users can accell any work-station and introduce a computer virus when plugging in their removable hard drives or flash drives. These will protect each device from the other in case some malicious user tries to insert a virus into the Server or legitimate users.

QUESTION-08.

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

ANSWER:-

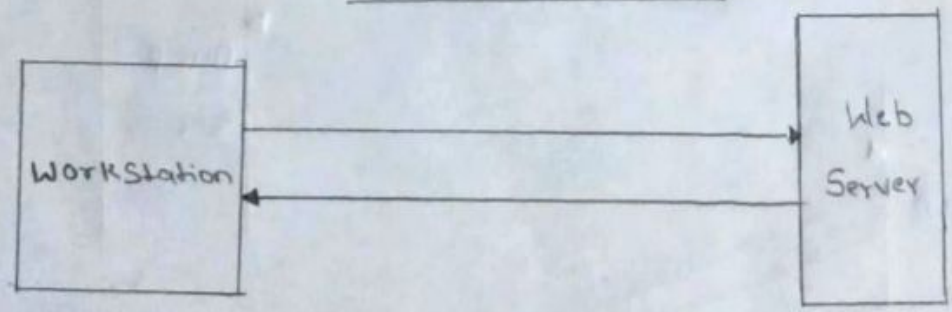
IP ADDRESS:-

An IP address is a unique address that identifies a device on the internet or a local network. IP stands for "Internet Protocol" which is the set of rules governing the format of data sent via the internet or local Network.

STATIC IP ADDRESS:-

A static IP address that is simply an address that doesn't change. Once you device is assigned a static IP address that number typically stays the same until the device is decommisioned. or your network architecture change. Static IP addresses generally used by servers or other important equipment.

STATIC IP ADDRESS.



Static IP address are assigned by Internet Service provider (ISP). Your ISP may or may not allocate you a Static IP addr-ess depending on the nature of your Service agreement. We describe your options a little later, but for now assume

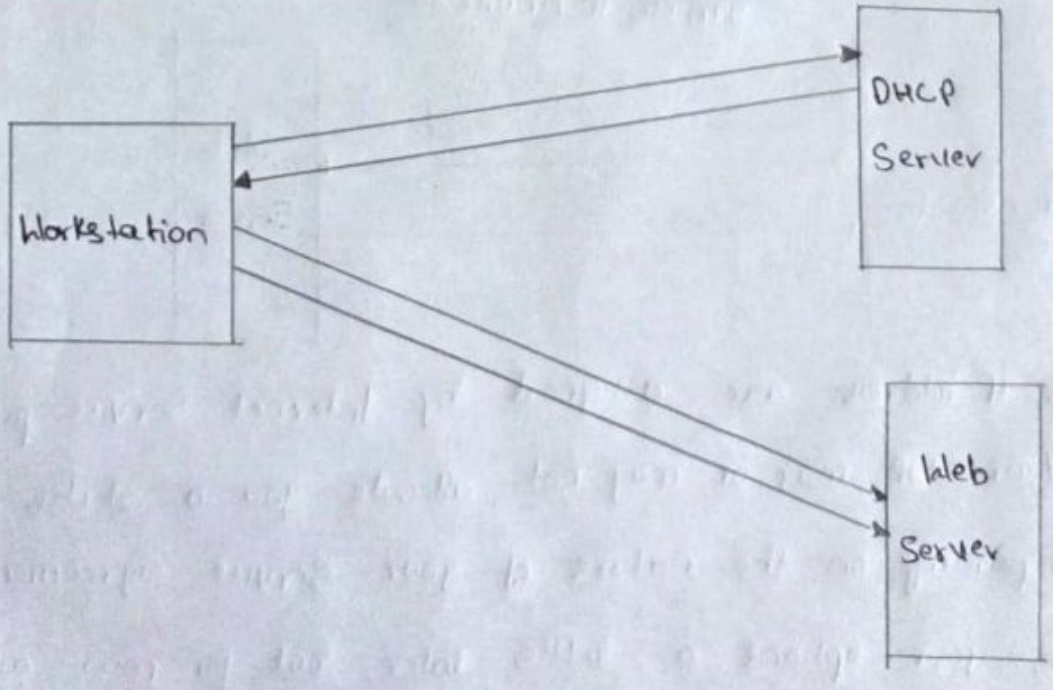
that a Static IP address adds to the cost of your ISP Contract. A Static IP address may be IPV4 or IPV6 in this case the important quality is static.

DYNAMIC IP ADDRESS:-

As the name suggests dynamic IP address are subject to change, sometimes at a moment's notic. Dynamic Addresses are assigned, as needed by Dynamic Host Configur-ation Protocol (DHCP) Servers.

We use dynamic address because IPV4 doesn't provide enough Static IP address to go around.. So for example a hotel probably has a Static IP address but each individual devices with in its rooms would have a dynamic IP address. On the internet, your home or office may be assigned a dynamic IP address by your ISP's DHCP Server.

DYNAMIC IP ADDRESS.



Difference between IPv4 and IPv6		
Differences	IPv4	IPv6
Addressing Method	A numeric address, and its binary bits are Seperately by a dot (.)	An alphanumric address whose binary are Separated by a colon (:).
Address Type	Unicast, broadcast and multicaste	unicast, multicast and anycast.
Address Mask.	use for the designated network from host portion	Not used.
Number of Header fields.	12	8
Length of the Header fields	20	40
Check Sum	Has Checksum fields	No checksum fields.
Number of Classes	class A to E	unlimited number of IP Addresses
Configuration	IP Addresses and routes must be assigned.	Configuration is optional depending on functions requ- -ired.
VLSM	Support	Not Support
fragmentati -on	Done by Sending and for - warding routes	Done by the Sender

Routing information Protocol.	Supported by the routed daemon.	RIP does not Support IPv6. It uses Static routes.
Network configoration	Manually or with DHCP	Auto configuration.
SNMP	SNMP is a protocol used for System management	SNMP does not Support IPv6.
DNS Record.	Pointer (PTR) records, IN-ADDR. ARPA DNS Domain	Pointer (PTR) records IP6. ARPA DNS domain.
IP to MAC resolution.	Broadcast ARP	Multicast Neighbor Solicitation.
Mapping	Uses Address resolution protocol (ARP) to map to MAC address.	Uses Neighbour resolution protocol (NRP) to map to MAC address.
Quality of Service.	Qos allow you to request packet priority and band with for TCP/IP applications.	Currenty, the IBM i implementation of QOS does not Support IPv6

QUESTION - 09

Discuss TCP/IP model in Details?

ANSWER :-

TCP/IP Stands for Transmission control protocol / Internet protocol and is a suite of communication protocol used to interconnect network device on the internet. TCP/IP is also used as a communication protocol in a private computer network. The TCP/IP protocol suit function as an abstraction layer between internet applications and the routing and switching fabric. TCP/IP specifies how data is exchanged over the internet by providing end to end communication that identify how it should be broken into packets, addressed, transmitted routed and received at the destination.

Common TCP/IP Protocols include the following:

Hypertext Transfer Protocol (HTTP), HTTP Secure, file Transfer Protocol

IMPORTANCE :-

→ TCP/IP is non-Proprietory and as a result is not controlled by any single company.

→ Therefore the IP suite can be modify easily.

→ It is compatible with all operating systems, so it can communicate with any other system.

→ The IP suite is also compatible with all types of computer hardware and network.

→ It is highly scalable and as a routable protocol, can determine the most efficient path through the network.

→ It is widely used in current internet architecture.

FOUR LAYERS OF TCP/IP MODEL:-

1. APPLICATION LAYER:-

It Provide applications with Standarized data exchange. Its protocol includes HTTP, FTP Simple mail transfer and Simple Network Management Protocol. At this layer, the payload is the actual application data.

2. TRANSPORT LAYER:-

It is responsible for maintaining end-to-end communication across the network. TCP handle communi-cation between hosts and provide flow control, Multi-plexing and reliability. It includes TCP and User Data-gram protocol.

3. INTERNET LAYER:-

It is also called as Network layer deals with packets and connet independent network to transport the packet across network boundaries. It includes the netwo-rk layer protocol are IP and internet control message Protocol, which is used for error reporting.

4. NETWORK LAYER:-

It is also known as physical or data link

Consists of protocol that operate only on a link the network component that interconnects nodes or hosts in a network. It includes Ethernet for local area network and Address Resolution Protocol.

ADVANTAGES :-

1 Helps establish a connection between different types of Computer.
2. Work Independently of the OS.
3. Support many routing protocols.
4. Use client Server architecture that is highly Scalable.
5. Can be operated Independently.
6 Support Several routing protocols.

DISADVENTAGES :-

1 It is complicated to set up and manage.
2. Transport layer does not guarantee delivary of packets
3 It is not easy to replace protocol in TCP/IP.
4. It is especially vulnerable to a Synchronization attack which is a type of denial-of-Service attack in which a bad actor uses TCP/IP.
5. It does not clearly separate the concepts of Services, interfaces and Protocols. So it is not suitable for describing new technologies in new networks.

QUESTION-10

What is Web Browser ? Give Some example of browsers?

ANSWER:-

A Web browser is a Software application that is used to access the world wide web (WWW) or as Known as by everyone on the internet. It is an interface between us and the information available on the web.

This information might be pictures, audio, video, or Some other files that shown on ower Screens through a web page.

The web browser can be called a client program as it requests the webserver for the information demanded by the user Some of the browser are Google, Mozilla firefox, Safari, internet explorer, Netscape, Nagigationetc The web browser is made up of Seven Components they are User interface, Browser Engine, Rendering engine, Networking UI Backend, JavaScript Interpreter and Data Persistence.

WEB BROWSER

Some of the Popular Web Browser :-

GOOGLE CROME :-

Google Crome is the most popular and used web browser. There is a high chance you are using it your-self right now. The reason behind its popularity is its speed. It is one of the faster browser - opens and loads quickly, the search results are retrieved with in seconds. Another reason might be its simple and easy to use ui.

GOOGLE CROME ICON

SAFARI :-

Although Safari is especially created for apple users it can be used on PCs as well. However, its uniqu-eness can only be seen on MAC or Apple devices. It is a cross compatible software and can integrate your data on multiple platform Another fascinating feature is icloud Keychain that lets you access your passwords Saved on your apple device.

SAFARI ICON

MOZILLA FIREFOX :—

These one is another popular choice among user. Although people have always Preferred this one as an option due to its Speed. It takes much more time than chrome or Safari.

MOZILLA FIREFOX ICON

OPERA :—

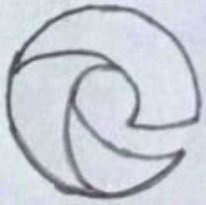
The opera is also one of the commonly used web browser. It has its own range of add-on extension that you might need to check out. It also can be Synced among multiple devices. So do not miss out on this one.

OPERA ICON

MICROSOFT EDGE :—

This one comes pre-installed on Windows 10 devices This was developed to to replace internet explorer and thus act as a default browser. It gaining popularity because of its new rendering. feature, easy to use UI, freeStyle writing over webpage displays. and much more.

MICROSOFT EDGE ICON

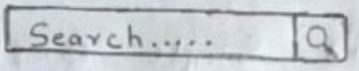


QUESTION - 11

What is a Search Engine? Give example?

ANSWER:-

A Search engine is a web based tool that is used by people to locate information on the internet. Some of the most popular examples are google, Being, Yahoo!, MSN Search. Google is the most used search engine world wide with a 92 percent market share in mid-2019. Google may be one of the most popular search engines but there are many more alternative search engine available for users.



Some Examples of Search Engine are :-

1 BING:-

Bing after Google is the best search engine example. Bing is operated and owned by Microsoft. Being provides the user a variety of search services, like web, video, image and map search product. It performs perfectly accross browser.

BING ICON

2. Yahoo!

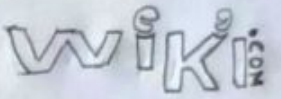
Yahoo another search engine example has been around before google. Yahoo offers loads of another services other than Search. Even on privacy front yahoo performs better than Google

It's web portal offers services like Sports, travel.

YAHOO! ICON 

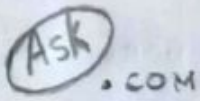
3. Wiki.com :-

Another search engine example is wiki.com users can use it as a quick reference guide for various topics. Wiki.com is the best choice for people who like wikipedia. type of content. It can be used as a quick reference guide

Wiki.com ICON 

4. ASK :-

As Previously called Ask Jeeves is another Popular Search engine. It loved for its simple Questions and answer format. This Search engine features tags on the side. It is also a video search engine. which locate Youtube videos for the user.

ASK ICON 

5. QUANT :-

Quant is a EU search engine. It does not do any user tracking and does not Personalize Search Results. The interface is user-friendly with myriad features like News, entertainment on the home page.

QUANT ICON 

QUESTION- 12

What is the Internet and what? What are the uses of Inte-rnet in our daily life?

ANSWER:-

INTERNET:-

Internt is the foremost important tool and the promi-nent resource that is being used by almost every person across the globe. It connects almost every person across the globe. It connect millions of computer, web pages, website and servers. Using the internet we can send emails, photos videos, message to our loved ones. Or in the words, the internet is a widespread interconnected network of compu-ters and electronic devices.

It creats a communication medium to share and get information online. If your device is connected to the internet then only you will be able to access all the applications, websits, social, media apps, and many more services. Internet now a days is considered as the fastest medium for sending and receiving information.

The Internet come in the yeare 1960 with the creation of the fist working model called ARPANET. It allow multiple computers to work on a single network that was their biggest achievement at that time. ARPANET use Packet Switching to communi cate

multiple computer systems under a single network.

WORLD WIDE WEB (WWW) :-

The world wide web (www) is combination of all resources and users on the Internet that are using the Hyper text Transfer Protocol (HTTP)

A broader definition comes from the world wide web Consortium (w3c)

" The World Wide Web is the universe of network - accessible information, an embodiment of human knowledge. "

In 1989, Berner - lee began work on the first world wide web server at CERN, He called the Server "httpd" and dubbed the first client "WWW". Originally, WWW was just a WYSIWYG hypertext browser/editor than ran in the Next Step environment.

The Web as it's commonly known, is often confus--ed with the internet. Although the two are intricately connected, they are different things. The internet is, as its names implies, a network. a vast global network. that incorporate a multitude of lesser networks. As. such the internet consist of. supporting infrastructure.

USE OF INTERNET IN OUR DAILY LIFE :-

1. USES OF THE INTERNET IN EDUCATION :-

The Internet is a great platform for students

to learn throughout their lifetime. They can use internet to learn new things and even acquire degree through online education programs. Teacher can also use the internet to teach student 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 notification and emails Apart from this, people can use the internet for money transfer, shopping order online food. etc.

3. USE OF INTERNET FOR SHOPPING:-

With the help of the internet, any body 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 AND 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 business starting everyday there by creating

job opportunities and reducing unemployment.

6. COMMUNICATION:-

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

7. DIGITAL TRANSACTION:-

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

8. MONEY MANAGEMENT:-

The Internet can also be used to manage money. Now there are many websites, application and others tools that help us in daily transaction, transfer, management, budget, etc.

9. TOUR & TRAVEL:-

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

QUESTION-13

What is an Internet Service provider? Give example of ISP in India.

ANSWER:-

The term internet Service provider (ISP) refers to a company that provides access to the internet to both personal and business customers. ISP's makes it possible for their customers to surf the web, shop online, conduct business, and connect with family and friends - all for a fee. ISPs may also provide other services including email services, domain registration, web hosting and browser packages.

An ISP may also be referred to as an information Service provider, a Storage Service provider an Internet Service provider (INSP), or any combination of these three based on the services the company offers. Internet Service was originally limited to government agencies and specific university departments. The technology was developed to provide access to the general public through the world wide web in the late 1980's.

EXAMPLE OF ISP IN INDIA :-

1 BHARTI AIRTEL :-

Bharti airtel is a leading and most trusted provider of ICT services in India and offers a diverse portfolio of services to enterprise, government, carrier etc.

2. BSNL BROADBAND :-

BSNL Broad band. services - choose the best broad - band plan, Broadband. Internet plan fixed. broadband, CDMA broadband, wi-max, fibe broadband Dial up etc.

3. IDEA CELLULAR Ltd :-

Idea cellular is a company of the Aditya Birla Group. India first truly multinational corporation idia is an integrated Gsm operator acrou India offering 2G and 3G.

JIO :-

Jio India's largest 4G network offers. the best prepaid and postpaid plans, Jio fiber broadband. plans and mole also Get mobile apps for your daily entertainment etc.

TATA TELE SERVICE :-

Tata tele business services limited formaly known as Tata tele service limited is an indian broadband and telecommunication service provider based in Mumbai It is subsidiary of Tata Group and Indian Conglom - erate.

QUESTION - 14

Discuss the difference between MAC Address, IP address and Port Address?

ANSWER:-

MAC ADDRESS:-

A media access control address (MAC) is a unique identifier assigned to a network interface controller (NIC) for use as a network address in communications with in a network segm-ent. This use is common in most IEEE 802 networking techn-ologies including Ethernet, Wi-fi and Bluetooth.

IP ADDRESS:-

An IP Address is a unique address that identifies a device on the internet or a local network. IP stands for "Internal Protocol" which is the set of rules governing the format of data sent via the internet or local network.

PORT ADDRESS:-

Port address is the logical address of each applica-tion or process that uses a network or internet to communicate. Port address guides the data to reach to the correct server application from your compiler and come back to the correct application to your computer.

Difference between MAC address, IP address and Port address :-

Sl No	MAC Address	IP Address	Port Address
1.	Media access control address is used to ensure the physical address of a computer	Internet Protocol (IP) address is used to identify a host in network	Port address is used to identify a process or service on your system.
2.	MAC address operates in the data link layer	IP address operates in the network layer	Port address is operate in the transport layer.
3.	MAC address has 48-bit address	IPv4 has 32 bits address and IPv6 has 128 bits address	Port address has 16-bit number address
4.	MAC address helps in simply identifying the device	IP address identifies the connection of the device on the network.	Port address are logical interfaces use by communication protocols.
5.	MAC address can't be found easily by the third party	IP address can be found by the third party	Port address is humble that can be used to provide information by anyone
6.	A device attached with MAC address can retrive by the ARP Protocol.	A device attached with IP address can retrieve by RARP Protocol.	Port Number are logical interfaces used by Communication protocol.

QUESTION-15

How do we view my Internet browser's history ?

ANISWER:-

As we browse the web, most web page data is Cached locally on your computer to help pages load faster and reduce the amount of data you need to transfer over our internet connection. To help kee browsing history private and to free up disk space on your computer you can view and clear your local browsing history.

To view browse history in Microsoft edge :-

In a microsoft edge browser window, open the history menu using the key board shortcut Ctrl + H. You can also access this menu with the following steps:-

Step 1:- Click the Hub button in the upper right - hand corner of the window.

Step 2:- Click history icon to the history men this menu allows you to view the pages you have visited in Chronological order

To view browse history in Google Crome:-

Step 1:- In any crome window, use the key board shortcut Ctrl+H, or navigate to the URL Chrome://history.

Step 2:- Or, click the menu button, which is located near the top-right side of the browser window, and choose

then History again.

To View history in opera :-

Step 1 :- In an opera browser window, click opera menu button in the upper left hand corner of the wirdow.

Step 2 :- choose history to open the history tab.

(or)

use keyboard shortcut Ctrl + H.

To view history in Safari :-

Step 1 :- open the Safari browser.

Step 2 :- click the history menu at the top of the screen the menu lists recent pages from your browser history. which you can navigate by clicking on them. To edit your history or view it in detail click show all history.

To view history in Mozilla firefox :-

Step 1 :- open the browser. click history on the menu bar at the top of the browser window.

Step 2 :- click show all history Select the date range you would like to see.