CERTIFICATE IN COMPUTER APPLICATION {CCA}

CCA – 102 DATA COMMUNICATIONS

ASSIGNEMENT

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Q 1: What are the different types of networks?

Ans → Types of Networks :-

1. Personal Area Network (PAN) :-

The smallest and most basic type of network, a PAN is made up of a wireless modem, a computer or two, phones, printers, tablets etc, and revolves around one person in one building.

2. Local Area Network (LAN) :-

~~We're~~ We're confident that you've heard of these types of networks before - LANs are the most frequently discussed networks, one of the most common, one of the most original and one of the simplest types of ~~m~~ networks.

3. Wireless Local Area Network (WLAN) :-

Functioning like a LAN, WLANs make use of wireless network technology, sel such as Wi-fi. Typically seen in the same types of applications as LANs, these types of networks don't require that devices rely on physical cables to connect to the network.

4. Campus Area Network (CAN) :-

largest than LANs, but smaller then metropolitan area networks (MANs, explained below), these types of networks are typically seen in universities, large K-12 school districts or small business.

5. Metropolitan Area Network (MAN) :-

These types of networks are larger than LANs but smaller then WANs - and incorporate elements from both types of networks.

6. Wide Area Network (WAN) :-

Slightly more complex than a LAN, a WAN connects computers together across longer physical distances.

7. Storage Area Network (SAN) :-

As a dedicated high-speed network that connects shared pools of storage devices to several servers, these types of networks don't rely on a LAN or WAN. ~~Ans~~

8. System Area Network (also known as SAN) :-

This term is fairly new within the past two decades. It is used to explain a relatively local network that

is designed to provide high-speed connection in server-to-server applications.

9. Passive Optical Local Area Network (POLAN) :-

As an alternative to traditional switch bassed Ethernet LANs, POLAN technology can be integrated into structured cabling to overcome concerns about supporting traditional.

10. Enterprise Private Network (EPN) :-

These types of network are built and owned by business that want to securely connect its various locations to share computer resources.

11. Virtual Private Network (VPN) :-

By extending a private network across the Internet, a VPN lets its users send and receive data as if their devices were connected to the private network - even if they're not. Through a virtual point-to-point connection, users can access a private network remotely.

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

Ans → Shielded twisted pair (STP):-

STP cable has an additional braided mesh coating or metal foil that wraps each set of insulated conductors. The metal casing intercepts the penetration of electromagnetic noise. It also can eradicate a phenomenon called crosstalk, which is the unwanted effect of one circuit (or channel) on another circuit (or channel).

It occurs when one line (acting as a kind of receiving antenna) picks up some of the signals travelling down another line (acting as a kind of sending antenna). This effect can be experienced during telephone conversations when one can hear other conversation in the background. Shielding each pair of a twisted pair cable can eliminate most crosstalk.

STP has the similar quality factor and uses the same connectors as UTP, but the shield must be connected to the ground.

Unshielded twisted pair (UTP):-

UTP cable is the

most prevalent type of telecommunication medium in use today. Its frequency range is suitable for transmitting both data and voice. Therefore, these are most commonly used in telephone systems.

A twisted pair consists of two insulated conductors (usually copper) in a twisted configuration. Color bands are used in plastic insulation for identification. In addition, colors also identify the specific conductors in a cable and to indicate which wires belong in pairs and how they relate to other pairs in a larger bundle.

The two wires are twisted in the twisted pair cable which significantly reduces the noise generated by the external source. The noise here we are talking about is generated when two wires are parallel which causes an increase in voltage level in the wire closest to the source and also uneven load and damaged signal.

Q 3: What is difference between baseband and broadband transmission?

Ans →

S.No.	Baseband	Broadband
1.	In baseband transmission, the type of signalling used is analog.	In broadband tranmission, the type of signalling used is digital.
2.	Baseband Transmission is unidirectional in nature.	Baseban Broadband transmision is bidirectional in nature.
3.	Signals can be travelled over long distances without being attenuated.	Signals can only travel over short distances.
4.	It is used with a bus as well as tree topology.	It works well with bus topology.
5.	Only PSK encoding is used.	In broadband transmission, Manchester and Differential Manchester encoding are used.

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

Ans → Difference between a hub, modem, router and a switch :-

Hub :-

Unlike switches, hubs broadcast data to all ports, which is inefficient, so hubs are basically a multiport repeaters.

Modem :-

Stands for "modulating - demodulating": modems are hardware devices that allows a computer or another device, such as a router or switch, to connects to the Internet. They convert or "modulate" an analog signal from a telephone or cable wire to digital data (1s and 0s) that a computer can recognize. Simply send traffic from point A to point B without further manipulation.

Routers :-

Are responsible for sending data from one network to another. Work at layer 3 (Network) of the OSI model, which deals with IP addresses. Typically routers today will perform the functionally of both a router and a switch.

Switches :-

They use the MAC address of a device to send data only to the port the destination device is plugged into. Work at layer 2 (Data Link) of the OSI model, which deals with MAC addresses.

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

Ans → The Media Access Control address for any network adapter is hard coded into the card it itself. Each manufacture of ~~the~~ network adapters has a group of characters assigned that refer specifically to that company. I belive that is the first 1/2 of the MAC address which is 12 hexadecimal characters long. But the MAC address is part and parcel of the network adapter, just as your internal organs are part of you. When you move to a new house, you take your liver with you. In the same way, when you move a NIC to a different computer, it takes its MAC address with it.

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

Ans → The term troubleshooting refers to the process of identifying problems with a network through a rigorous and repeatable process and then solving those problems using testable methods. Troubleshooting is more effective than trying things at random until the network functions, and encourages you to document your process. Network troubleshooting is useful for almost anyone, from a computer enthusiast to an aspiring network engineer.

The common hardware - related problems can occur :-

When you're beginning the troubleshooting process, check all your hardware to make sure it's connected properly, turned on, and working. If a cord has come loose or somebody has switched off an important router, this could be the problem behind your networking issues. There's no point in going through the process of troubleshooting network issues if all you need to do is plug a cord in. Make sure all switches are in the correct positions and

haven't been bumped accidentally. Next, turn the hardware off and back on again. This is the mainstay of IT troubleshooting, and while it might sound simplistic, often it really does solve the problem. Power cycling your modem, router, and PC can solve simple issues - just be sure to leave each device off for at least 60 seconds before you turn it back on.

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

Ans → A good firewall. This can stop intrusions, malware, unauthorized access, etc. before they reach the workstation

Antivirus software on the servers and at the endpoint workstations. This software should be centrally managed to keep end users updated constantly and to minimize user meddling with the settings. Good antivirus will also protect email clients.

Educated and aware users who: do not casually install downloaded programs; don't click on unknown links; don't fall for phishing emails, etc. Establish a strong password policy for all users. You should consider not giving your users Administrative rights on their accounts. They will complain that they cannot install what they need and your workload will increase but, I guarantee you, your entire environment will be more reliable and secure.

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

Ans→ Static IP :-

Use advanced setting to reserve an IP address for a device on your local network. Your device keeps the same IP address until you cancel the reservation or remove the device from your network, even if the device is disconnected.

When you sign up for Google Fiber for small business, you can choose to have no static IPs (that is dynamic IPs for all your devices), one static IP, or multiple static IPs. The number of static IPs available is shown on the screen when you sign up for service. If you sign up for static IPs, we will assign addresses to you when your service is installed and activated.

Dynamic IP :-

Use advanced setting for your network to configure dynamic DNS. When your IP address changes, the DNS entry for your server is automatically updated with its new IP address, so outside users can use the same domain name. You

can choose the Dynamic DNS provider and don't have to install additional software on your computer.

S.No	IPV4	IPV6
1.	IPV4 has 32-bit address length.	IPV6 has 128-bit address length
2.	It supports Manual and DHCP address configuration.	It supports Auto and renumbring addres configuration.
3.	In IPV4 end to end connection integrity is Unachievable.	In IPV6 end to end connection integrity is Achievable.
4.	It can generate 4.29x 10^9 address space	Address space of IPV6 is quite large it can produce 3.4x 10^{38} address space.
5.	Security feature is dependent on application	IPSEC in inbuilt security feature in the IPV6 protocol.
6.	Address representation of IPV4 is in decimal	Address representation of IPV6 is in hexadecimal

Q 9: Discuss TCP/IP model in detail.

Ans→ The TCP/IP model (Transmission Control Protocol/ Internel Protocol) is a model with four layers which is for both modelling current internet architecture, as well as providing a set a rules that govern all forms of transmission over a network. DARPA, an agency of the United States Department of Defense, created it in the 1970s. It evolved from ARPANET, which was an early wide area network and a predecessor of the Internet. The TCP/IP Model is sometimes called the Internet Model or less often the DoD Model.

This model was being made at the same time as the OSI Model was created. The TCP/IP model is not the same as the OSI model, however it was influenced by the model, which is why many names of the different layers are the same.

The TCP/IP model describes a set of general design guidlines and implementation of specific networking protocols to enable computers to communicate over a network. TCP/IP provides end-to-

end connectivity specifying how data should be formatted, addressed, transmitted, routed and received at the destination. Protocols exist for a variety of different types of communication services between computers.

TCP/IP has four abstraction layers as defined in RFC 1122: link layer, IP layer, transport layer and application layer. People often compare this layer architecture with the seven layer OSI Reference Model; using terms such as Internet reference model. This is incorrect, however, because it is descriptive while the OSI Reference Model was intended to be prescriptive, hence being a reference model.

Q 10: What is a Web Browser ? Give some example of browsers.

Ans → A Web browser, or browser for short, is a computer software application that enables a person to locate, retrieve, and display content such as webpages, images, video as well as other files on the World Wide Web.

Browsers work because every web page, image, and video on the web has its own unique Uniform Resource Locator (URL), allowing the browser to identify the resource and retrieve it from the web server.

Some example of Browsers :-

1. Google Chrome :- Chrome, created by internet giant Google, is the most popular browser in the USA, perceived by its computer and smartphone users as fast, secure, and reliable. There are also many options for customization in the shape of useful extensions and apps that can be downloaded for free from the Chrome store.

2. Apple Safari :- Safari is the default on Apple computers and phones, as well as

other Apple devices. It's generally considered to be on efficient browser. Its slick design being in keeping with the ethor of Apple.

3. Microsoft Internet Explorer and Edge :- Although it has been discontinued, Internet Explorer is worthy of mention as it was the go-to browser in the early days of the internet revolution, with usage share rising to 95% in 2003.

4. Mazilla Firefox :- Unlike Chrome, Safari, Internet Explorer, and Microsoft Edge, Firefox is an open-source browser, created by community members of the Mazilla Foundation. It is perhaps the most so customizable of the main browser, with many add ons and extensions to choose from. In late 2003, it had a usage share of 32.21% before gradually losing out to competition from Google Chrome.

Q 11: What is a search engine? Give example.

Ans → Search Engine :-

A search engine is a website through which users can search internet content. To do this, users enter the desired search term into the search field. The search engine then looks through its index for relevant websites and displays them in the form of a list. The search engine's internal evaluation algorithm determines which position a website will get in the search results. Ex:- Google, Bing and Yahoo are examples of popular search engines.

Google :- Google takes first place in search engines. According to the research of statista and statcounter, around 92.16% of searches are happening on Google, demanding in the market. If you want any of the information, just Google it!

Bing:- Bing is a Microsoft product now, which is known as Microsoft Bing. Bing has now renamed to Microsoft Bing in October 2020. Microsoft Bing is another popular search engine that takes place another after Google. Although the searching ratio on Bing is less than Google, but it

takes second place after Google. Around 2.18% of searches are happening on Microsoft Bing.

Yahoo :- Before Google entered the market, Yahoo was the most popular search engine. When Google came into use, Yahoo's popularity began to wane and it went off the market. Nowdays, very few people use the ~~Yo~~ Yahoo search engine. In the United States, Yahoo is the default search engine for Mozilla Firefox since 2014 till now. Yahoo is the most search engine in the United states.

Q 12: What is the Internet & WWW? What are the use of internet in our daily life?

Ans → **Internet :-**

The internet is a global network of networks connecting millions of users worldwide via many computer networks using a simple standard common addressing system and basic communications protocol called TCP/IP.

This allows message sent over the internet to be broken into small pieces, called packets, which travel over many different routes between source and destination computers.

Fortunately, nobody owns the internet, there is no centralized control, and nobody can turn it off.

It's evolution depends on rough consensus about technical proposal, and on running code.

Engineering feed-back from real implementations is more important than any architectural principles.

WWW :-

WWW stands for World Wide Web. Technically the World Wide Web can be defined as "All the resources and users on the Internet that are

using the Hypertext Transfer Protocol (HTTP).

The World Wide Web, or simply web, is a way of accessing information over the medium of the Internet.

The World Wide Web is the universe of networks - accessible information.

Important use of Internet in Our ~~Dat~~ Daily Life :-

1. Use of the 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 business 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 Transaction :-

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 ~~are~~ that help us in daily transactions, transfers, management, budget, etc.

9. Tour & Travel :-

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

Q 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 services for accessing, using, or participating in the internet. Internet services typically provided by ISPs include Internet access, Internet transit, Domain name registration, web hosting and Usent Services.

Types of ISPs :-
1. Dial-up Services
2. Broadband high-speed Internet
3. Digital line Subscribes (DSL)

Some example of ISP in India :-

Jio, Airtel, Vodafone, Idea Cellular, BSNL, Reliance Communications, Aircel, Tata Teleservices, Telenor India, MTNL.

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

Ans → MAC address :-

The MAC address is used to identify your computer on the network and to talk to other computers on the local network, including your router.

IP address :-

The IP address is used to identify your computer on the larger Internet. This includes servers like http://www.quora.com and others. Once off of the local network, only the IP address is significant.

Port address :-

The port address is used to select a particular service to connect to, such as HTTP, FTP, mail, etc. Port numbers are also used on your computer to identify specific processes, so you can have multiple windows open connected to different or the same server.

Q 15: How do we view my internet browser's history?

Ans → We view my internet browser's history :-

First ~~Step~~ :- Method :-

1. Open Google Chrome. It's a red, yellow, green, and blue circular icon.
2. Click ⋮ : This option is in the top-right corner of the window.
3. Select History. You'll see this option near the top of the drop-down menu. Selecting it will prompt a pop-out menu.
4. Click History. It's at the top of the pop-out menu. Doing so will take you to your search history.
5. Review your browsing history. You can scroll down through your browsing history to see items from earlier in your history, or you can click a link to re-open its page.

Second Method :-

1. Open Google Chrome. It's a white app with the Chrome icon on it.
2. Tap ⋮ : This icon is in the top-right corner of the screen.
3. Tap History. It's near the middle of the menu.
4. Review your browsing history. Tapping a history item will take you to its page.

Third Method :-

1. Open Firefox: It's a blue globe with an orange fox wrapped around it.
2. Click ≡. This option is in the top-right corner of the Firefox window. Clicking it prompts a drop-down menu to appear.
3. Click Library. This option is in the drop-down menu.
4. Click History. It's near the top of the menu.
5. Click Show all History. This option is at the bottom of the History menu. Clicking it opens your Firefox history in a separate window.
6. Rivew your history. Double-clicking a search term will open it in your Firefox browser.

Fourth Method :-

1. Open Firefox: It's the blue globe with an orange fox icon.
2. Tap ≡. This is in the bottom-right corner of the screen. A pop-up window will appear.
3. Tap History. It's in the menu. Doing so opens your Firefox mobile history page.
4. Review your Firefox history: Tapping an item will open it in Firefox, while swiping left over an item will remove it from your browsing history.