CERTIFICATE IN COMPUTER APPLICATION(CCA)

CCA -102 : DATA COMMUNICATION

ASSIGNMENT

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Data Communications Assignment

Q.1. What are the different types of networks?

Ans ⇒ Types of networks :—

i.) 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.

ii.) Local Area Network (LAN)
-> We are confident that you've heard of these types of networks before, LANs are most frequently discussed network.

iii.) Wireless Local area Network (WLAN)
-> Functioning like a LAN, WLANs make use of wireless network technology.

iv.) Campus Area Network (CAN)
->Larger than LANs, but smaller than metropolitan area networks (MANs, explained below)

v.) Metropolitan Area Network (MAN)
-> These types of networks are larger than LANs

but smaller than WANs - and incorporate elements from both types of networks.

vi.) Wide Area Network (WAN)
→ slightly more complex than a LAN, a WAN connects computers together across longer physical distances.

vii.) storage - Area Network (SAN)
→ Types of storage-area networks includes converged, virtual and unified SANs.

viii.) System - Area Network (also known as SAN)
→ This term is fairly new within the past two decades.

ix.) Passive optical Local Area Network (POLAN)
→ As an alternative to traditional switch - based Ethernet LANs.

x.) Enterprise private Network (EPN)
→ These types of networks are built and owned by businesses that want to securely connect its various locations to share computer resources.

xi.) Virtual private Network (VPN)
→ By extending a private network across the Internet.

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

Ans. → **Shielded twisted pair (STP):—**

Shielded twisted-pair (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 picks up some of the signals travelling down another line. This effect can be experienced during telephone conversations when one can hear other conversations 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) cable :—

This 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.

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Q.3.) What is different between baseband and broadband transmission ?

Ans. →

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

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

Ans.→

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 allow a computer or another device, such as a router or switch, to connect to the Internet. simply send traffic from Point A to Point B without further manipulation
Router	Are responsible for sending data from one network to another. Work at Layer 3 (Network) of the OSI model, which deals with IP

Router	addresses. Typically, routers today will perform the functionality of both a router and a switch. that is, the router will have multiple ethernet ports that devices can plug into.
Switche	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.

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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 (MAC address) for any network adapter is hard coded into the card itself. Each manufacturer of network adapters has a group of characters assigned that refer specifically to that company. I believe that is the first 1/2 of the MAC address which is 12 hexadecimal characters long. But the MAC addresses 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.

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Q.6.) When troubleshooting computer network problem. What common hardware-related problems can occur?

Ans. → **Troubleshooting computer network problem :-**

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 because it allows you to target individual network components, testing each for function, and encourages you to document your process. Network troubleshooting is useful for almost anyone, from a computer-enthusiast to an aspiring network engineer.

Common hardware-related problem :-

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.

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

Ans.→ You need AT LEAST three levels of security:

1. A good firewall. This can stop intrusions, malware, unauthorized access, etc. before they reach the workstations.

2. 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.

3. Educated and aware users who: do not casually install download program; 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.

Remember: your computing environment is only as secure as your weakest link and non-compliant user. *****

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, 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 settings for your network to configure dynamic DNS. When your IP addresses changes, the DNS entry for your server is automatically updated with its new IP addresses. 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.

different between IPv4 and IPv6 :-

	IPv4		IPv6
1.	It supports Manual and DHCP address configuration.	1.	It supports Auto and renumbering address configuration
2.	In IPv4 end to end connection integrity is unachievable.	2.	In IPv6 end to end connection integrity is achievable.
3.	It can generate 4.29×10^9 address space	3.	Address space of IPv6 is quite large it can produce 3.4×10^{38} address space.
4.	security feature is dependent on application.	4.	IPSEC is inbuilt security feature in the IPv6. protocol.
5.	Address representation of IPv4 is in decimal.	5.	Address Representation of IPv6 is in hexadecimal.

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Q.2) Discuss TCP/IP model in detail.

Ans.→ The TCP/IP model (Transmission control protocol/ Internet 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 is why many names of the different layers are the same.

The TCP/IP model describes a set of general design guidelines and implementations 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 varienty of different types of communication services between computers.

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

Ans.→ **Web Browser :-**

A web browser, or browser for short, is a computer software application that enables a person to locate, retrieve, and displays 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 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, preceived by its computer and smartphones users as fast, secure, and reliable.

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

3. Microsoft Internet Explorer and Edge :- Althogh it has been discontinused, Internet Explorer is worthy of mention.

4.) Mozilla Firefox :- firefox is an open-source browser.

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

Ans. → A search engine is a software system that is designed to carry out web searches which means to search the world wide web in a systematic way for particulars information specified in a textual web search query. The search results are generally presented in a line of results, often referred to as search engine results pages. The information may be a mix of links to web pages, images, videos, infographics, articles, research papers, and other types of files. Some search engines also mine data available to in databases or open directories. Unlike web directories, which are maintained only by human editors, search engines also maintained only by human editors, search engines also maintain real time information by running an algorithm on a web crawler.

example :-

1.) Google
2.) Yahoo!
3.) ~~Baidu~~ Bing
4.) Internet Archive
5.) Ask.com

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

Ans.→ The Internet is the global system of interconnected computer networks that uses the Internet protocol suite to communicate between networks and devices. It is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies.

The World Wide Web (WWW), commonly known as the web, is an information system where documents and other web resources are identified by Uniform Resource Locators, which may be Internet and accessible over the Internet.

The uses of internet in our daily life :-

(i) communication
(ii) Education
(iii) Online job search
(iv) Entertainment
(v) shopping
(vi) Online Banking
(vii) Utility Bill payment
(viii) Book tickets
(ix) Ordering food
(x) Research

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Q.) 13.) What is an Internet service provider? Give some example of ISP in India.

Ans. → Internet service provider:-

An Internet service provider (ISP) is a company such as AT&T, Verizon, comcasl, or spectrum that provides Internet access to companies, families, and even mobile users. ISPs use fiber-optics, satellite, copper wires, and other forms to provide Internet access to its customers.

The type of Internet access varies depending on what the customer requires. For home use, cable or DSL is the perfect, affordable choice. The price of home use can range anywhere from free to roughly $120 a month. The amount of Bandwidth is the amount of data that can be sent through an internet connection in a given amount of time.

Example of ISP in India:-

1.) Reliance Jio
2.) Airtel
3.) Vodafone ~~data~~ Idea
4.) BSNL
5.) Telenor India

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Q. 14.) Discuss the difference between MAC address, IP address and port address.

Ans. →

	MAC Address		IP Address
1.	MAC address stands for media Access control Address.	1.	IP Address stands for Internet protocol address.
2.	MAC Address ensure that physical address of the computer is unique.	2.	IP Address is a logical address of the computer and is used to uniquely locate computer connected via a network.
3.	MAC Adress is of six byte hexadecimal address.	3.	IP Address is of 4 bytes or of 16 bytes.
4)	MAC address can be retrieved using ARP protocol.	4.	IP address can be retrieved using RARP protocol.
5.	chip maker or manufacturer provides the MAC address.	5.	Internet service provider. ISP provides the IP address.

port address :-

Port numbers are used ~~for~~ as part of IP communications to determine which program the communication is to or from.

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

Ans.→ In a Microsoft Edge browser window, open the history menu using the keyboard shortcut ctrl+H. You can also access this menu with the following steps:-

- click the Hub button in the upper right-hand corner of the window.
- click the History icon to open the history menu.

This menu allows you to view the pages you've visited in chronological order.

2nd method:-

Google chrome on their Android phone or tablet can view their history with the following steps.

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

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