SCHEME OF EVALUATION
Scoring Indicators)

Revision:2015 Course Code:6043
Course Title: Computer Hardware and Networking

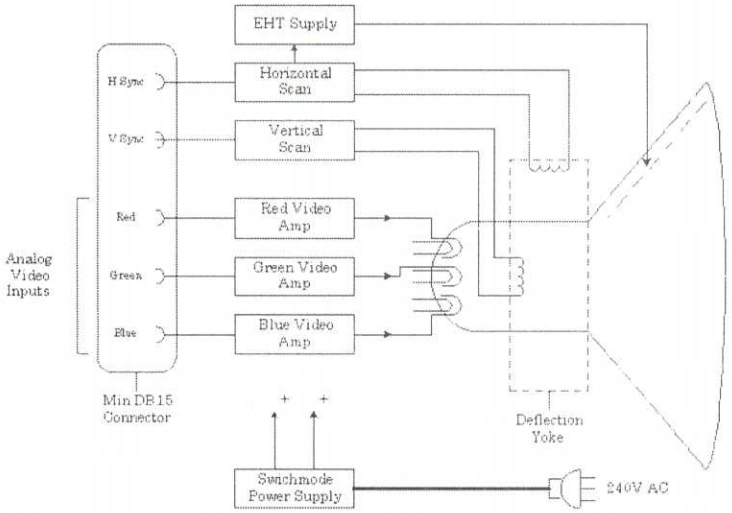
Q.NO	Scoring Indicators	Split up score	Sub Total	Total
	PART A			
I .1.	**Advantages** 1. The switch mode power supply has a smaller in size. 2. The SMPS has light weight. 3. It has a better power efficiency typically 60 to 70 percent. 4. It has a strong anti interference. 5. SMPS has wide output range. 6. Low heat generation in SMPS. 7.	Any two 2	2	10
2.	Ink jet,laser	Any two 2	2	
3	Sound card, video card, network interface card, i/o card	Any Two 2	2	
. 4.	Latency is the average time for the sector being accessed to rotate into position under a head, after a completed seek	2	2	
5.	Micro wave communication, satellite communication.	Any two 2	2	
	PART B			
II 1.	The most common type of scanner, flatbed scanners have a large glass surface and a lid. Some models of flatbed scanner come built in to all-in-one devices, which function as printers, scanners, copy machines and fax machines. A flatbed scanner is an optical scanner which makes use of a flat surface for scanning documents. The scanner is capable of capturing all elements on the document and does not require movement of the document. Flatbed scanners are	6	6	

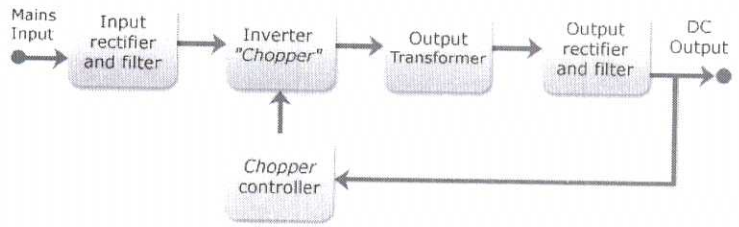
	effective scanners for delicate materials such as vintage photographs, papers and other documents which are fragile.A flatbed scanner is also known simply as a flatbed.			30
2	The cache memory lies in the path between the processor and the memory. The cache memory has lesser access time than memory and is faster than the main memory. **Level 1 (L1) cache or Primary Cache** L1 is the primary type cache memory. The Size of the L1 cache very small comparison to others that is between 2KB to 64KB, it depend on computer processor. It is a embedded register in the computer microprocessor(CPU).The Instructions that are required by the CPU that are firstly searched in L1 Cache. **Level 2 (L2) cache or Secondary Cache** L2 is seconday type cache memory. The Size of the L2 cache is more capacious than L1 that is between 256KB to 512KB.L2 cache is Located on computer microprocessor.After searching the Instructions in L1 Cache,if not found then it searched into L2 cache by computer microprocessor. The high-speed system bus interconnecting the cache to the microprocessor. **Level 3 (L3) cache or Main Memory** The L3 cache is larger in size but also slower in speed than L1 and L2,it's size is between 1MB to 8MB.In Multicore processors, each core may have seperate L1 and L2,but all core share a common L3 cache. L3 cache double speed than the RAM.	6	6	
3	RIMM memory is expensive and slower then DIMMs. RIMM that use 16-bit data bus has 2 notches and 184-pins. RIMM that use a 32-bit data bus has a single notch and 232-pins, it supports dual channels. With RIMMs all memory slots on the motherboard must be filled to maintain continuity through out all slots. If the slot is not filled with ram it must have a placeholder module called a C-RIMM (Continuity RIMM) to ensure continuity through out all slots..	6	6	

	SIMM memory (single inline memory module) has two types of modules, SIMM-30 and SIMM-72. SIMM is measured in nanoseconds, which is the measure of access time it takes for the processor to access the data stored on the SIMM. SIMM-30 is a 16-bit module with 30 terminals. It takes 4 matching modules for get 64-bit data path. SIMM-72 is a 32-bit module with 72 terminals and must be installed in matching pairs Dual Inline Memory Module (DIMM): Has a separate electrical connector on both sides of the module. It stores each bit of data in a separate capacitor, providing direct access to the motherboard through the system bus.			
4	An initial formatting of a hard drive that initializes the physical tracks on the surface or the internal disks. The drive manufacturer performs a **low-level format** on the hard drive before it is released and is not something an end-user needs to do to their hard drive. **High level formatting** is the mthod of formatting a hard drive that initializes portions of the hard drive and creates important file system areas on the disk. A high-level format is commonly done if a user wishes to erase the hard drive and reinstall the operating system back onto the hard drive. If errors are present on the hard drive, or a high-level format is unable to be completed, a low-level format may need to be done first.	3+3	6	
5	File allocation table, FAT is a method of keeping track of the contents of a hard drive. The table is a chart of numbers that correspond to cluster addresses on the hard drive. Different types of FAT that have been used are FAT8 The oldest FAT, FAT8 was used on 8-inch floppies with the 8086 processor.			

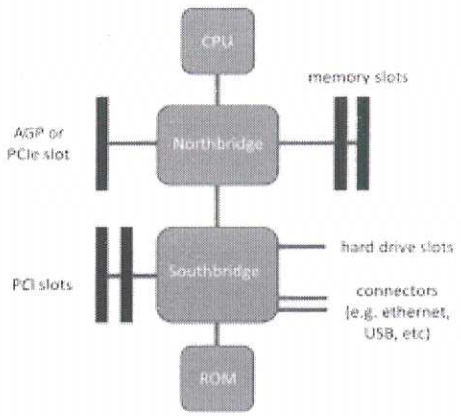
	FAT12 A File Allocation Table that uses 12-bit binary system that was derived from FAT8. FAT16 FAT utilizing a 16-bit binary system. Used with Windows 3.x to Windows 95. FAT32 Enhanced File Allocation Table utilizing a 28-bit binary system, first used in Windows 95 OSR2 and Windows 98, that saves disk space by using 4 k cluster.	6	6	
6	**Network Hub** A network hub is designed to connect computers A network hub is used for a private network, one that does not have any connections to sources other than local computers. When a hub receives a packet of data from a connected device, it broadcasts that data packet to all other connected devices regardless of which one ends up being the final destination. Additionally, network bandwidth is split between all of the connected computers. So, the more computer that are connected, the less bandwidth that is available for each computer, which means slower connection speeds.		6	
	Network Switch A network switch also connects computers to each other, like a hub. Where the switch differs from a hub is in the way it handles packets of data. When a switch receives a packet of data, it determines what computer or device the packet is intended for and sends it to that computer only. It does not broadcast the packet to all computers as a hub does which means bandwidth is not shared and makes the network much more efficient. For this reason alone, switches are usually preferred over a hub.	3+3		
7	Twisted Pair Cable Copper wires are the most common wires used for transmitting			

	signals because of good performance at low costs. They are most commonly used in telephone lines. However, if two or more wires are lying together, they can interfere with each other's signals. To reduce this electromagnetic interference, pair of copper wires are twisted together in helical shape like a DNA molecule. Such twisted copper wires are called twisted pair. To reduce interference between nearby twisted pairs, the twist rates are different for each pair. Coaxial Cable Coaxial cables are copper cables with better shielding than twisted pair cables, so that transmitted signals may travel longer distances at higher speeds. A coaxial cable consists of these layers, starting from the innermost – • Stiff copper wire as core • Insulating material surrounding the core • Closely woven braided mesh of conducting material surrounding the insulator • Protective plastic sheath encasing the wire Coaxial cables are widely used for cable TV connections and LANs. Optical Fibre Thin glass or plastic threads used to transmit data using light waves are called optical fibre. Light Emitting Diodes (LEDs) or Laser Diodes (LDs) emit light waves at the source, which is read by a detector at the other end. Optical fibre cable has a bundle of such threads or fibres bundled together in a protective covering. Each fibre is made up of these three layers, starting with the innermost layer – • Core made of high quality silica glass or plastic • Cladding made of high quality silica glass or plastic, with a lower refractive index than the core • Protective outer covering called buffer	Any Two 3+3	6	

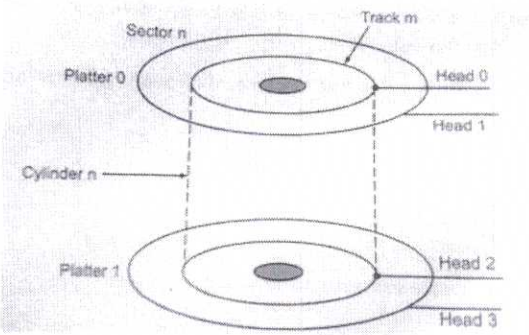
III a	**PART C** VGA Colour Monitor  The 3 main signals from a video adapter to a monitor are video signal, horizontal synchronization, vertical synchronization. The video signal is send to the video amplifier stage where the signal is boosted so that it can drive the tube. The amplified video signal is send to the CRT and it controls the no of electrons that reach the screen and the brightness of the display. The vertical synchronization controls the vertical deflection of the beam. The output of horizontal oscillator is used to generate the high voltage needed y the picture tube .This voltage is called extra high tension voltage(EHT).	Fig4+ Exp4	8	
III b	The optical mouse is a computer mouse first introduced by Microsoft , that utilizes LEDs (light-emitting diodes) or laser to help track movement. These mice are identified by examining the bottom of the mouse. As seen in the picture the optical-mechanical mouse has a ball, and the optical mouse has a light emitting from the bottom. An optical mouse also has a tiny low-resolution camera that takes a thousand or more pictures every second. In the camera, the CMOS (complementary metal-oxide semiconductor) sensor sends a			

	signal to a DSP (digital signal processor). The DSP can analyze each picture for pattern and light changes and then based on those changes moves the mouse cursor on your screen.	7	7	
IV a	 **Input rectifier stage** If the SMPS has an AC input, then the first stage is to convert the input to DC. This is called **Inverter stage** The inverter stage converts DC to AC by running it through a power oscillator. **Voltage converter and output rectifier** If the output is required to be isolated from the input, as is usually the case in mains power supplies, the inverted AC is used to drive the primary winding of a high-frequency transformer. This converts the voltage up or down to the required output level on its secondary winding. If a **DC** output is required, the **AC** output from the transformer is rectified. The rectified output is then smoothed by a filter consisting of inductors and capacitors. **Regulation** A feedback circuit monitors the output voltage and compares it with a reference voltage, as shown in the block diagram above.	Fig4+ exp4	8	
IV b	**Dot matrix printer** A dot matrix is a 2D matrix of dots that can represent images, symbols, or characters. They are used for electronic displays, such as computer monitors and LED screens, as well as printed output. All dot matrix printers create characters on paper by striking an inked ribbon with a hard surface. Unlike typewriters, which use a similar mechanism, dot matrix printers do not have fixed character shapes or fonts. Instead, each individual character is formed by the arrangement of a series of pins. This allows dot matrix printers to be used for basic graphical printing and multiple fonts as well as basic			

	text printing -- but it gives the printout a characteristic "dotted" appearance. Dot matrix printouts often produce lower-quality text that can be difficult to read. In addition, dot matrix printers generally are noisier than inkjet or laser models.	7	7	
V.a	The Read and write (R/W) memory of a computer is called RAM. The RAM is a volatile memory; it means information written to it can be accessed as long as power is on. As soon as the power is off, it can not be accessed. RAM holds data and processing instructions temporarily until the CPU needs it.RAM is made in electronic chips made of so called semiconductor material. There are two basic types of RAM **Dynamic RAM:** loses its stored information in a very short time (for milli sec.) even when power supply is on. D-RAM's are cheaper & lower. It is made of millions of transistors and capacitors. . The capacitor holds the bit of information – a 0 or a 1. The transistor acts as a switch that lets the control circuitry on the memory chip read the capacitor or change its state. A capacitor is like a small bucket that is able to store electrons. To store a 1 in the memory cell, the bucket is filled with electrons. To store a 0, it is emptied. The problem with the capacitor's bucket is that it has a leak.Hence refresh operation happens automatically thousands of times per second. **Static RAM** , S-RAM retains stored information only as long as the power supply is on. Static RAM's are costlier and consume more power. They have higher speed than D-RAMs. In static RAM, a form of flipflop holds each bit of memory. A flip-flop for a memory cell takes four or six transistors along with some wiring, but never has to be refreshed. This makes static RAM significantly faster than dynamic RAM. However, because it has more parts, a static memory cell takes up a lot more space on a chip than a dynamic memory cell. Static RAM is fast and expensive, and dynamic RAM is less expensive and slower. Static RAM is used to create the CPU's speedsensitive cache, while dynamic RAM forms the larger system RAM space. Some other RAMS are **SDRAM (Synchronous DRAMS)**, SGRAMs (Synchronous Graphic RAMs) These RAM chips use the same clock rate as	8	8	

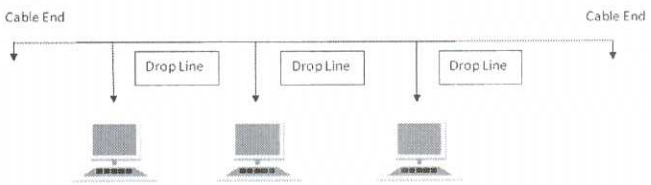
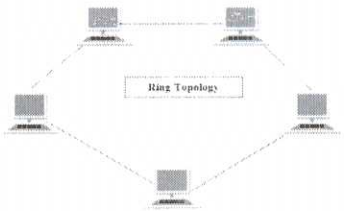
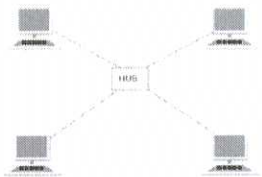
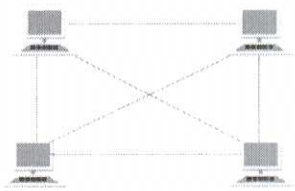
V.b	CPUuses. They transfer data when the CPU expects them to be ready. **DDR-SDRAM (Double Data Rate – SDRAM)** : This RAM transfers data on both edges of the clock. Therefore the transfer rate of the data becomes doubles. **Memory refresh** is the process of periodically reading information from an area of computer memory and immediately rewriting the read information to the same area without modification, for the purpose of preserving the information. Memory refresh is a background maintenance process required during the operation of semiconductor dynamic random-access memory (DRAM), the most widely used type of computer memory, and in fact is the defining characteristic of this class of memory. In a DRAM chip, each bit of memory data is stored as the presence or absence of an electric charge on a small capacitor on the chip.[2][3] As time passes, the charges in the memory cells leak away, so without being refreshed the stored data would eventually be lost. To prevent this, external circuitry periodically reads each cell and rewrites it, restoring the charge on the capacitor to its original level. Each **memory refresh cycle** refreshes a succeeding area of memory cells, thus repeatedly refreshing all the cells in a consecutive cycle. This process is conducted automatically in the background by the memory circuitry and is transparent to the user.[2] While a refresh cycle is occurring the memory is not available for normal read and write operations	7	7	
VI.a	.  A motherboard is a computer's main circuit board, and it includes the following attached to a fixed planar surface: • Input/output ports • Peripheral connections			

	• PCI expansion slots • Bus and power connectors • Heat sinks and mounting points for fans and major components, including the central processing unit (CPU) and optional coprocessors • Supporting chipset for CPU, bus and external components • BIOS • Memory sockets for RAM, ROM and cache • Interconnecting circuitry	Fig4+ exp4	8	
VI.b	ROM stands for **Read Only Memory**. The memory from which we can only read but cannot write on it. This type of memory is non-volatile. The information is stored permanently in such memories during manufacture. A ROM stores such instructions that are required to start a computer. **PROM (Programmable Read Only Memory)** PROM is read-only memory that can be modified only once by a user. The user buys a blank PROM and enters the desired contents using a PROM program. Inside the PROM chip, there are small fuses which are burnt open during programming. It can be programmed only once and is not erasable. **EPROM (Erasable and Programmable Read Only Memory)** EPROM can be erased by exposing it to ultra-violet light for a duration of up to 40 minutes. Usually, an EPROM eraser achieves this function. During programming, an electrical charge is trapped in an insulated gate region. The charge is retained for more than 10 years because the charge has no leakage path. For erasing this charge, ultra-violet light is passed through a quartz crystal window (lid). This exposure to ultra-violet light dissipates the charge. During normal use, the quartz lid is sealed with a sticker. **EEPROM (Electrically Erasable and Programmable Read Only Memory)** EEPROM is programmed and erased electrically. It can be erased and reprogrammed about ten thousand times. Both erasing and programming take about 4 to 10 ms (millisecond). In EEPROM, any location can be selectively erased and programmed. EEPROMs can be erased one byte at a time, rather than erasing the entire chip. Hence, the process of reprogramming is flexible but slow.	7	7	

VII. a	The hard disk uses a rigid or hard substrate called platter. One or more platters are mounted on a common spindle. A platter has two magnetic surfaces, top and bottom. It consists of a spindle motor to drive the above mentioned stack of platters about its axis at a speed ranging from 3600 rpm to 10000 rpm. A set of magnetic heads made up of thin magnetic film are also mounted on a common shaft which perform the operation of accessing the information from the platters. Information is recorded on both the sides of the disk, such thatmagnetized spot on platter is used for storing 1 and a non-magnetized spot is used for storing 0. The outer surface of top and bottom disk cannot be used for storing information as they can't be accessed. Information is recorded on the circular tracks and the track is divided into sectors. The capacity of the hard disk depends upon the total number of usable surface, bytes stored per sector, sectors per track, tracks per surface.  	Fig3+ exp5	8	
VII.b.	The most spectacular form of ESD is the **spark**, which occurs when a strong electric field creates an ionized conductive channel in air. This can cause minor discomfort to people, severe damage to electronic equipment, and fires and explosions if the air contains combustible gases or particles. A spark is triggered when the electric field strength exceeds approximately 30 kV/cm (the dielectric field strength of air). This may cause a very rapid increase in the number of free electrons and ions in the air,			

	temporarily causing the air to abruptly become an electrical conductor in a process called dielectric breakdown. A **corona discharge** is an electrical **discharge**brought on by the ionization of a fluid such as air surrounding a conductor that is electrically charged. Spontaneous **corona discharges** occur naturally in high-voltage systems unless care is taken to limit the electric field strength **Brush discharge** — occurs at a curved electrode (radius between 5 and 50 mm)[3] in the vicinity of a flat electrode. It consists of a short ionization channel which breaks up into a fan of multiple moving streamers which strike toward the other electrode. If the electrode is too sharp, a corona discharge will usually occur instead of a brush discharge.	7	7	
VIII. a	NTFS (NT file system; sometimes New Technology File System) is the file system that the Windows NT operating system uses for storing and retrieving files on a hard disk. NTFS is the Windows NT equivalent of the Windows 95 file allocation table (FAT) and the OS/2 High Performance File System (HPFS). When a hard disk is formatted (initialized), it is divided into partitions or major divisions of the total physical hard disk space. Within each partition, the operating system keeps track of all the files that are stored by that operating system. Each file is actually stored on the hard disk in one or more clusters or disk spaces of a predefined uniform size. Using NTFS, the sizes of clusters range from 512 bytes to 64 kilobytes. Using NTFS, the larger the hard disk the larger the default cluster size. When a file is created using NTFS, a record about the file is created in a special file, the Master File Table (MFT). The record is used to locate a file's possibly scattered clusters. High-performance file system, HPFS was first introduced with IBM's OS/2 version 1.2. HPFS is available on subsequent versions, as well as with Microsoft Windows NT3.0. HPFS supports long file names and large hard drives when compared			

VIII.b.	to FAT. **HPFS features** • HPFS supports a maximum of 64 GBytes • HPFS386 is a 32-bit version of HPFS used with IBM LAN Server Advanced and Warp Server Advanced. • HPFS is not commonly used with today's computers and servers. **Antistatic wrist strap** An **antistatic wrist strap** is an antistatic device used to safely ground a person working on very sensitive electronic equipment, to prevent the buildup of static electricity on their body, which can result in electrostatic discharge (ESD).It consists of an elastic band of fabric with fine conductive fibers woven into it, attached to a wire with a clip on the end to connect it to a ground conductor. The fibers are usually made of carbon or carbon-filled rubber, and the strap is bound with a stainless steel clasp or plate. **Antistatic bag** An **antistatic bag** is a bag used for storing or shipping electronic components which may be prone to damage caused by electrostatic discharge (ESD). **Antistatic mat** An **antistatic floor mat** or **ground mat** is one of a number of antistatic devices designed to help eliminate static electricity. It does this by having a controlled low resistance: a metal mat would keep parts grounded but would short out exposed parts; an insulating mat would provide no ground reference and so would not provide grounding. The mat would need to be grounded (earthed). The resistor, as well as allowing high-voltage charges to leak through to earth, also prevents a shock hazard when working with low-voltage parts. **Anti-Static Spray** **It** the electrostatic charges that attract dust particles and cause **static** electricity. Effectively eliminates **static**shock and **static** cling. ... **Use** on rugs, carpets, drapes and cloth furniture to help prevent **static** electricity.	3.5+3.5 8	7 8	
IX.a.	**BUS Topology** Bus topology is a network type in which every computer and			

IX.b.	network device is connected to single cable. When it has exactly two endpoints, then it is called **Linear Bus topology**.  **RING Topology** It is called ring topology because it forms a ring as each computer is connected to another computer, with the last one connected to the first. Exactly two neighbours for each device.  **STAR Topology** In this type of topology all the computers are connected to a single hub through a cable. This hub is the central node and all others nodes are connected to the central node.  **MESH Topology** It is a point-to-point connection to other nodes or devices. All the network nodes are connected to each other. Mesh has n(n-1)/2 physical channels to link n devices.  A virtual private network (VPN) is a network that is constructed using public wires —usually the Internet — to connect remote users or regional offices to company's private internal network. A VPN secures the private network, using encryption and other	2X4	8	

X.a.	security mechanisms to ensure that only authorized users can access the network and that the data cannot be,intercepted. This type of network is designed to provides a secure, encrypted tunnel in which to transmit the data between the remote user and the company network.The information transmitted between the two locations via the encrypted tunnel cannot be read by anyone else because the system contains several elements to secure both the company's private network and the outside network through which the remote user connects through. The first step to security is usually a firewall between the client and the host server, requiring the remote user to establish an authenticated connection with the firewall. Encryption is also an important component of a secure VPN. Encryption works by having all data sent from onecomputer encrypted in such a way that only the computer it is sending to can decrypt the data. **Layer 7 - Application** In the OSI model, this is the layer that is the "closest to the end user". Applications that work at Layer 7 are the ones that users interact with directly. A web browser (Google Chrome, Firefox, Safari, etc.) or other app - Skype, Outlook, Office - are examples of Layer 7 applications. **Layer 6 - Presentation** The Presentation Layer represents the area that is independent of data representation at the application layer - in general, it represents the preparation or translation of application format to network format, or from network formatting to application format. In other words, the layer "presents" data for the application or the network **Layer 5 - Session** When two devices, computers or servers need to "speak" with one another, a session needs to be created, and this is done at the Session Layer. Functions at this layer involve setup, coordination (how long should a system wait for a response, for example) and termination between the applications at each end of the session. **Layer 4 – Transport** The Transport Layer deals with the coordination of the data transfer between end systems and hosts. How much data to send, at what rate, where it goes, etc. The best known example of the Transport Layer is the Transmission Control Protocol (TCP), which is built on top of the Internet Protocol (IP), commonly known as TCP/IP. TCP and UDP port numbers work at Layer 4, while IP addresses work at Layer 3, the Network Layer.	7	7	

X.b.	**Layer 3 - Network** , this layer is responsible for packet forwarding, including routing through different routers **Layer 2 – Data Link** The Data Link Layer provides node-to-node data transfer (between two directly connected nodes), and also handles error correction from the physical layer. Two sublayers exist here as well - the Media Access Control (MAC) layer and the Logical Link Control (LLC) layer. In the networking world, most switches operate at Layer 2. **Layer 1 - Physical** At the bottom of our OSI bean dip we have the Physical Layer, which represents the electrical and physical representation of the system. This can include everything from the cable type, radio frequency link (as in an 802.11 wireless systems), as well as the layout of pins, voltages and other physical requirements. When a networking problem occurs, many networking pros go right to the physical layer to check that all of the cables are properly connected and that the power plug hasn't been pulled from the router, switch or computer. Internet is a network of computers linking many different types of computers all over the world.It is a network of networks sharing a common mechanism for addressing(identifying) computers,and a common set of communication protocols for communications between two computers on the network. **Applications of Internet** 1. Communication Computer users around the world extensively use the email service on internet to communicate with each other. Pictures, documents and other files are sent as email attachments. Internet telephony is another common communications service made possible by the creation of the Internet. 2. Job search 3. Online Shopping 4. Stock market updates 5. Travel One can use internet to gather information about various tourist place . 6. Research Research papers are present online which helps in the researcher doing aliterature review	8	8	

	7. Video Conferencing: It enables direct face-to-face communication across networks via web cameras, microphones, and other communication tools. Video conferencing can enable individuals in distant locations to participate in meetings on short notice, with time and money savings. 8. E-Commerce **E–commerce** (electronic **commerce** or EC) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, 9. On-line payments 10. Social networking Social networking is the use of internet-based social media programs to make connections with friends, family, classmates, customers and clients. Social networking can be done for social purposes, business purposes or both.	Any 7	7	