

**Scheme of Valuation**  
**Scoring Indicators**

Course : Computer System Hardware

Code : TED (15) 4131  
Revision : 2015

Question No.	Scoring Indicators	Split Score	Total Score
I	1	1	2
	Basic Input/Output System consists of low-level software that controls the system hardware and acts as an interface between the operating system and the hardware.	1	
I	2	4 x 1/2	2
I	3	2 x 1	2
I	4	2 x 1	2
I	5	2 x 1	2
II	1	3 x 2	6
II	2	6 x 1	6

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II 3	<p>PATA(Parallel ATA) 1) based on parallel signalling technology &amp; IDE drives operates according to this standard</p> <p>2) 2 IDE devices are connected using single IDE cable</p> <p>3) 40 pin round-like, wide data cable can be up to 18 inches long</p> <p>SATA(Serial ATA) - 1) based on serial signalling technology</p> <p>2) cables are thinner, flexible, less massive &amp; can be up to a meter long</p> <p>3) power and data split into two connections &amp; sends data only one bit at a time and data transfer rates are faster than PATA</p>	3 + 3	6
II 4	<p>Types of keyboard connectors.</p> <p>1) AT connector (DIN connector) - round 13.2mm diameter, in a 5-pin DIN configuration.</p> <p>2) PS/2 connectors (mini DIN connector) - smaller 6-pin mini-DIN connector.</p> <p>3) USB connector - used in latest keyboard and when system contains only one PS/2 port</p> <p>4) IrDA connector (Infrared) - wireless interface</p>	4 x 1.5	6
II 5	<p>1) An audio and video editing workstation is used during many stages of development when creating audio and video material.</p> <p>2) An audio editing workstation is used to record music, create music CDs, and CD labels.</p> <p>3) A video editing workstation can be used to create television commercials, prime-time programming, and movies for the theatre or home movies.</p> <p>features</p> <p>1. Video enhancements - Audio/video editing workstations use graphics adapters with multiple video interfaces that can be used simultaneously. To improve video editing performance, graphics adapters that support CUDA and OPENCL are used.</p> <p>2. Specialized audio - In order to perform high quality work like that in A/V workstations, digital audio is preferred.</p> <p>3. Specialized drives - A/V editing workstations often use a data drive as input source for video editing apart from the drive that contains the operating system.</p>	3	6
II 6	<p>An ultrabook is a high-end laptop, trademarked brand by Intel, sleek in design but uncompromising in performance.</p> <p>Characteristics of Ultrabooks</p> <p>1. Slim Design - from 18mm to 21mm thickness.</p> <p>2. Fast Resume from Sleep - typically within less than 7 seconds.</p> <p>3. Intel Core Processor Inside - Intel's third-generation Core processor</p> <p>4. Built-in security - Intel has built Anti-theft and Intel Identity Protection Technology into the Intel silicon and come pre-installed on Ultrabooks.</p> <p>5. USB 3.0 and/or Thunderbolt Ports - speedy enough to transfer a full-length HD movie in less than 30 seconds.</p> <p>6. Minimum 5 hours of Battery Life</p>	6 x 1	6

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II 7	<p>1. basically an extension of the motherboard of a laptop.</p> <p>2. designed to stay behind when the laptop is removed</p> <p>3. it can contain things like a full-sized drive bay and expansion bus slots.</p> <p>4. can function as a port replicator.</p> <p>5. It contains ports so that peripherals such as monitors, keyboards, printers, and so on can remain connected to the dock</p> <p>6. A docking station is connected to the laptop through a proprietary docking port.</p>	6 x1	6
III a	<p>CPU Socket, Memory Slots, CMOS Battery, ISA, PCI and AGP Slots, Power Connectors, Chipset, Back Panel and Ports etc.. <b>any 4</b></p> <p>CPU Socket - provides mechanical &amp; electrical connections between a microprocessor &amp; a printed circuit board &amp; allows the CPU to be replaced without soldering. For chips with large number of pins, zero insertion force (ZIF) sockets or land grid array (LGA) sockets used.</p> <p>Memory Slots - allows computer memory (RAM) to be inserted into the computer. Usually 2 to 4 memory slots and that determine the type of RAM used with the computer.</p> <p>CMOS Battery - Nonvolatile BIOS memory refers to a small memory on PC motherboards that is used to store BIOS settings. It was traditionally called CMOS RAM because it used a volatile, low-power complementary metal-oxide-semiconductor (CMOS) SRAM powered by a small battery when system power was off.</p> <p>Chipset - There are two chips in the core logic chipset on a personal computer (PC) motherboard, 1) Northbridge (Memory controller hub) 2) Southbridge (I/O controller hub)</p> <p>Expansion Slots - socket on the motherboard that is used to insert an expansion card (or circuit board), which provides additional features to a computer such as video, sound, advanced graphics, Ethernet or memory.</p>	4 x 2	8
	<p>The combination of DRAM chips soldered onto the circuit board makes up a memory module or memory package.</p> <p>1. SIMM (Single inline Memory Module) 2. DIMM (Dual Inline)</p> <p>3. SODIMM (Small outline DIMM) 4. MicroDIMM</p> <p>5. RIMM (Rambus Inline)</p>	3	

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III b	<p>SIMM - either a 30-pin or 72-pin edge connector that inserts into the motherboard memory sockets at a 45 degree angle.</p> <p>DIMMs - 64-bit memory modules that are used as a package for the SDRAM family: SDR, DDR, DDR2, and DDR3. DIMMs differentiate the functionality of the pins on one side of the module from the corresponding pins on the other side.</p> <p>SODIMM - Notebook computers and other computers that require much smaller components use a much smaller memory form factor, such as a small outline DIMM. Available in many physical implementations, including the older 32-bit (72- and 100-pin) configuration and newer 64-bit (144-pin SDR SDRAM, 200-pin DDR/DDR2, and 204-pin DDR3) configurations.</p> <p>RIMM- a trademark of Rambus Inc. is a custom memory module that carries DRDRAM and varies in physical specification, based on whether it is a 16-bit or 32-bit module.</p> <p>MicroDIMM - extremely small RAM form factor. It is over 50 percent smaller than a SODIMM, only 45.5 millimeters (about 1.75 inches) long and 30 millimeters (about 1.2 inches) wide. It was</p>	4	7
IV a	<ol style="list-style-type: none"> <li>1) Main - General product information including BIOS type, processor, memory, and time/date</li> <li>2) Advanced - Configuration information for the CPU, memory, IDE, super I/O, trusted computing, USB, PCI, MPS and other information</li> <li>3) PCI - Configure the server to clear NVRAM during system boot</li> <li>4) Boot - Configure the boot device priority</li> <li>5) Security - set or change the user or supervisor passwords</li> <li>6) Chipset - view the configuration of system chipsets</li> <li>7) Exit - Save changes and exit, discard changes and exit, discard changes or load optimal or fail-self defaults. <b>(ANY 4)</b></li> </ol>	4 x 2	8
IV b	<ol style="list-style-type: none"> <li>1) Power On Self Test</li> <li>2) the first process that a computer undergoes when booting</li> <li>3) ensures that all the devices attached to the CPU is communicating properly</li> <li>4) Most chips use a system of beep codes to indicate the POST status to the user.</li> <li>5) after loading the CMOS information the POST will begin inspecting and comparing the system settings with what is installed in the computer.</li> <li>6) then it will check the real time clock RTC or system timer and the computer system bus</li> <li>7) the POST is complete if all the drives passed the test and then it instructs the computer to start the process of loading the operating system</li> </ol>	7 x 1	7

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V a	<p>1) Small Computer System Interface (SCSI) is a standard electronic interface that allows computers to communicate with peripheral hardware</p> <p>2) SCSI bus will support up to seven devices connected in daisy chain plus the host adapter with each device having a unique ID</p> <p>3) devices can be either internal or external to the computer.</p> <p>4) 8-bit SCSI-1 and SCSI-2 internal devices use a SCSI A cable, a 50-pin ribbon cable similar to that of an IDE drive. 16-bit SCSI uses a SCSI P cable, with 68 wires and a 68-pin D-subminiature connector. There is also an 80-pin internal SCA connector ideal for use in hot-swapping environments.</p> <p>5) SCSI devices function independently of one another</p> <p>6) Increased fault tolerance and performance</p> <p>7) Each SCSI drive has its own embedded disk controller that can function independently from the system CPU</p> <p>8) Portability of external devices</p>	8 x 1	8
V b	<p>1) RAID - Redundant Array of Independent Disks. It's a way of combining the storage power of more than one hard disk for increased performance or fault tolerance.</p> <p>3) Common terms - Disk Array, Disk Array Adapter (RAID Controller) and Reserved Sector.</p> <p>4) commonly used RAID levels are RAID 0, RAID 1 and RAID 5</p> <p>5) RAID 0 - Also known as disk striping. Data is written across multiple drives, so one drive can be reading or writing while the next drive's read-write head is moving, makes for faster data access. If any one of the drives fails, all content is lost.</p> <p>6) RAID 1 - Also known as disk mirroring. produces fault tolerance by writing all data simultaneously to two separate drives. But doesn't help access speed, and the cost is double that of a single drive.</p> <p>7) RAID 5 - Combines the benefits of both RAID 0 and RAID 1, creating a redundant striped volume set. Each stripe places data on n-1 disks, and parity computed from the data is placed on the remaining disk. The parity is interleaved across all the drives in the array so that neighboring stripes have parity on different disks.</p>	7 x 1	7
VI a	<p>1) Disk Mirroring (RAID-1) duplexing data in separate volumes on two hard disks to make the storage more fault-tolerant.</p> <p>2) This provides data protection in the case of disk failure, because data is constantly updated on both the disks.</p> <p>3) The server provides only half of its available space to users</p> <p>4) since the disks rely upon a common controller, access to both copies of data is threatened if the controller fails.</p> <p>1) Duplexing is a variation of disk mirroring in which multiple storage disks have their own SCSI controller.</p> <p>2) The use of redundant controllers enables continued data access as long as one of the controllers continues to function.</p> <p>3) superior to mirroring in terms of availability</p> <p>4) not only provides protection against drive failure but also against the failure of either of the controllers</p>	4	8
		4	

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VI	b	<p>1) Partitioning and formatting are the 2 primary methods used to prepare hard drives for supporting operating systems and applications</p> <p>2) Partitioning is the process of dividing one physical harddrive into separate areas of storage useful for storing files, installing multiple operating systems and supporting multiple file system structures.</p> <p>3) Primary partition - contains an active, bootable operating system such as DOS or Windows</p> <p>4) Extended partition - separated into units called logical partitions</p>	4	7
		<p>1) Formatting is a two-level process that prepares a partition on a hard drive to accept an operating system, along with files and programs.</p> <p>2) Low-level formatting - physical formatting process that erases all information and prepares the hard drive for a logical structure</p> <p>3) High-level formatting - takes place after the hard drive has been partitioned</p>	3	
VII	a	<p>An expansion card (also known as an adapter card) is simply a circuit board you install into a computer to increase the capabilities of that computer.</p> <p>The most common types of expansion cards are</p> <p>1) Video - Video cards are responsible for converting the data sent to it by the CPU into the pixels &amp; Accelerating the speed of display. PCIe and AGP slots are commonly used now.</p> <p>2) Multimedia - The common multimedia adapters are - Sound Cards, TV tuner cards &amp; Video capture cards</p> <p>3) I/O - I/O cards provide interfaces for input/output devices. Common examples of I/O are the serial (RS-232) and parallel (printer) ports and drive interface connections.</p> <p>4) Communications - Communications adapters give a computer the ability to transmit information to other devices that might be too distant to cable up to directly. The common examples are network adapters, modems, wireless NICs and cellular cards.</p>	4 x 2	8
VII	b	<p>Video Display Types</p> <p>1) CRT</p> <p>2) Liquid crystal display</p> <p>3) LED displays</p> <p>4) Plasma</p> <p>5) OLED</p> <p>6) Projection systems</p>	0.5x6 = 3	7
		CRT, LCD, LED, Plasma - explanation	4	



Question No.		Scoring Indicators	Split Score	Total Score
IX	a	<p>Laptop Processors-</p> <ol style="list-style-type: none"> <li>Streamlined connection to the motherboard</li> <li>Laptop processors are generally either soldered directly to the motherboard or attached using the Micro-FCBGA (Flip Chip Ball Grid Array) standard.</li> <li>Lower voltages and clock speeds So heat is reduced and also performance.</li> </ol> <p>Active sleep and shutdown modes  Processor throttling – processor runs in a lower power state when on battery power. Motherboard consults with OS in making such a decision.</p>	4	8
IX	b	<p>Touchscreens converts stimuli generated by touching into electrical signals used to replace keyboard and mouse.</p> <p>Touchscreen technology</p> <ol style="list-style-type: none"> <li>Resistive Touchscreen - consists of two thin layers both have a coating on one side separated by a thin gap, with the coated sides facing each other inside the gap. When the screen is pressed, the coating on the layers comes into contact and a voltage is passed, which is in turn processed as a touch in that location.</li> <li>Capacitive Touchscreen - work by sensing the conductive properties of an object, usually the skin on the fingertip. It consists of a glass panel coated with a capacitive material Indium Tin Oxide(ITO)</li> <li>Surface acoustic wave touchscreen Technology - contains 2 transducers along with some reflectors. The waves propogates across the glass and reflected back to the sensors.</li> <li>Infrared touchscreen technolgy - an array of X and Y axes are fitted with pairs of IR LEDs and photo detectors</li> </ol>	1+ (4x1.5)	7
X	a	<p>A tablet computer is a thin, flat mobile computer with a touchscreen display, processing circuitry, and a rechargeable battery in a single device.</p> <p>Characteristics of Tablet Pcs</p> <ol style="list-style-type: none"> <li>Operating System - mainly Apple iOS, Google Android, Microsoft Windows, Blackberry Tablet OS</li> <li>Screen Size &amp; Resolution -Screen size 5 inches to 12 inches. Resolution minimum 720 pixels across the shorter dimension</li> <li>Memory (RAM) -Depending on the applications typically 4GB to 16 GB</li> <li>Wireless Connectivity -Wi-Fi connectivity (802.11 b/g)</li> <li>Camera - typically two cameras. One on front side and one on rear side.</li> <li>Speakers - built in speakers</li> <li>Inputs and outputs - 3.5 mm headphone jack and USB port. Some manufacturers provide a docking port for connection to keyboards and docking stations</li> <li>Battery Life -Three things affect tablet battery life: size of the battery, brightness of the screen backlight, and amount of time the tablet is on.</li> </ol>	8 x 1	8

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X	b LAPTOP DISASSEMBLY Removing Hard drive, Memory and Optical Drives Step 1: Unlock and remove the battery. Step 2: Remove screws securing the service cover on the bottom and remove the cover. Step 3: Under the cover you can access the hard drive, both RAM modules, Wi-Fi card and CMOS battery. Step 4: Remove one screw securing the hard drive caddy. – Slide the hard drive assembly to the left to disconnect it from the motherboard. Step 5: Remove one screw securing the optical drive. Slide the optical drive to the left and pull it out of the case To remove the keyboard Step 1: With a small flathead screwdriver push the latches securing the keyboard. Step 2: Lift up the keyboard. Turn it upside down and place on the palm rest	5	7
		2	