UNIVERSITI TEKNOLOGI MALAYSIA

SECP1513 - SECTION 04

TECHNOLOGY AND INFORMATION SYSTEM

GROUP DISCUSSION: DICUSSION 01- THE SYSTEM UNIT

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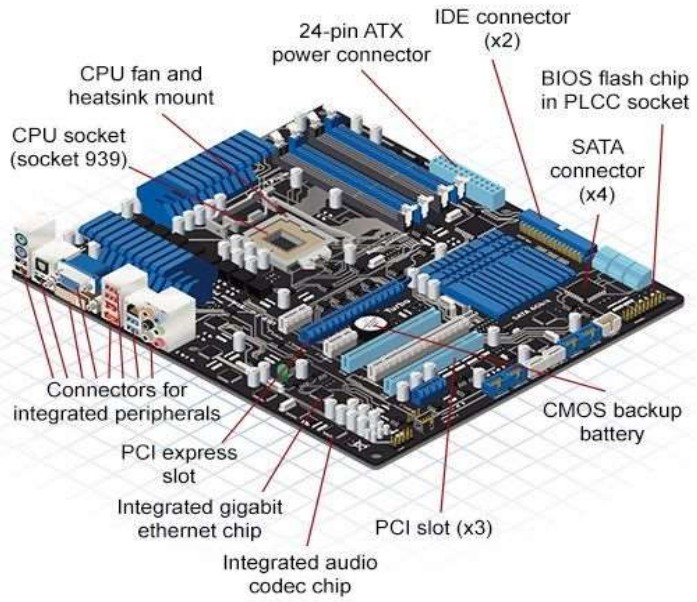
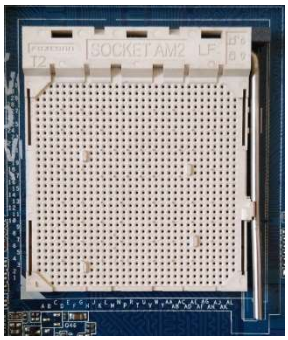
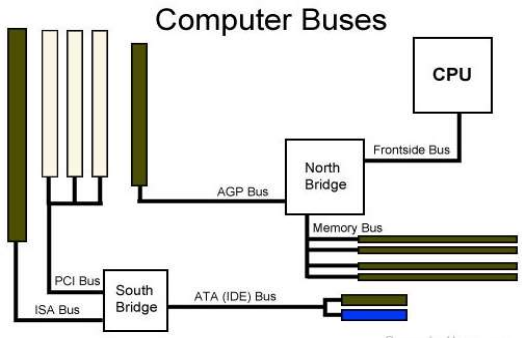
1. MOTHERBOARD/ SYSTEM BOARD

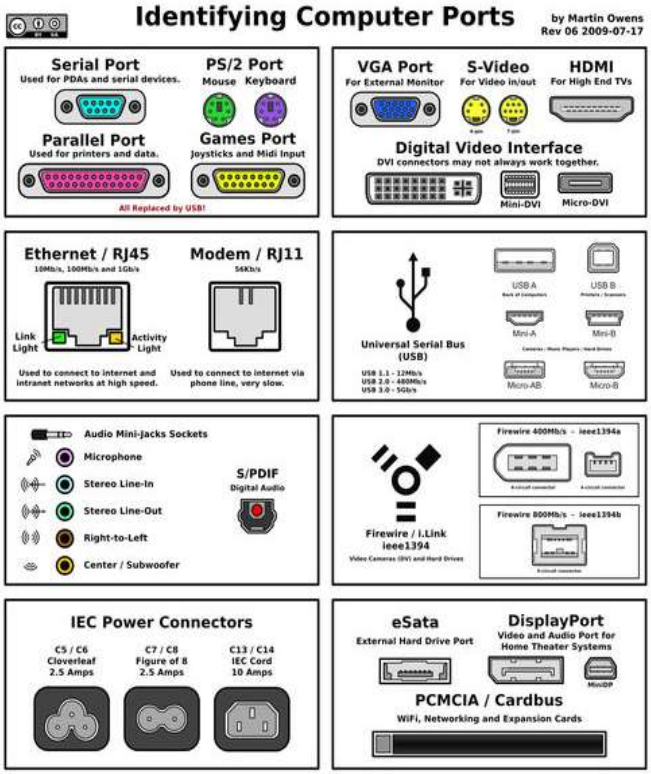
Motherboard / System Board	**Function:** A motherboard is backbone that ties the computer's components together at one spot allows different component talk to each other. **Popular Brands:** ASUS, MSI, GIGABYTE, ASROCK.



FUNDAMENTAL SPECIFICATION OF A MOTHERBOARD:

A) Socket & Chips  	**Function:** 1. Sockets used to connect different components, and chips are the leaders who direct these components to work normally. 2. BIOS is a kind of ROM chip for using during the startup routine (boot process) to check out the system and prepare to run the hardware.
B) Bus Lines & Expansion Buses 	**Function:** 1. Provide a "way" for different components and I/O to communicate data and transmit information. 2. Expansion buses are used to connect more components and be responsible for information transmission between motherboards' port & expansion slot and the hardware components.

C) Ports



Function:

1) *Standard Computer Ports*

I. Universal Serial Bus (USB)

- widely supported by many peripheral devices such as keyboards, mice, printers and storage devices nowadays as many of the motherboard's I/O panel do have the USB ports.

II. Ethernet

- provide the support of High-Speed Network up to 100Mbps, 1Gbits or 10Gbits for the user by connecting Ethernet cable into the Ethernet port at the I/O port.

III. High-Definition Multimedia Interface (HDMI)

- Allows the output of the high-definition (HD) video and audio from the motherboard to the monitor.

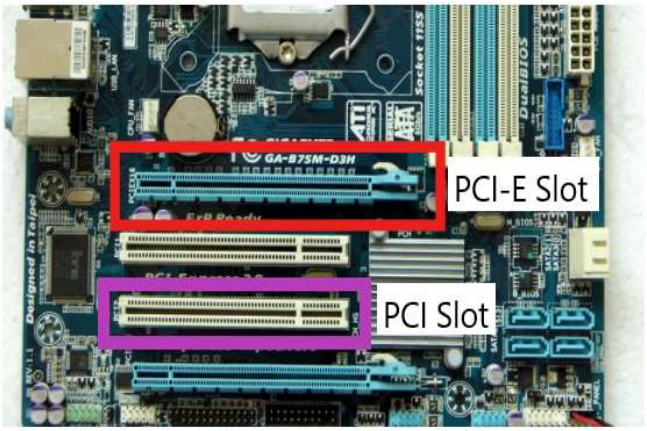
IV. Thunderbolt

- Provides a very high-speed connection to the peripheral or external devices.

- Support up to 7 connections of different peripheral or external devices at the same time.

	2) *Specialized Ports* V. External Serial Advanced Technology Attachment (eSATA) • allows the connection of high-speed external secondary storage such as external hard drives. VI. Musical Instrument Digital Interface (MIDI) • Allows the connection of musical instruments such as a musical keyboard for audio recording. VII. Mini-DisplayPort (MiniDP or mDP) • Mainly used for transferring the video display and audio from the computer to a large monitor. VIII. Video Graphics Array (VGA), Digital Visual Interface (DVI) • Connect the display monitor by transferring the analog video signal to the digital display monitor. IX. FireWire • Provide the high-speed connection to FireWire devices such as old external hard drives and digital camcorders.

d) Expansion Slot



Function:

- Act a socket or a port for connecting the expansion cards to expand the capabilities and features of a computer.
- The PCI-E slot is commonly used for inserting high bandwidth required cards such as external Graphics Card as the PCI-E slot offers for highest speed data transferring among other types of expansion slot
- PCI slot is mainly used to insert the Network Interface Card (NIC) and Wireless Network Card to expand a computer's capabilities and features.

Differentiate & Price:

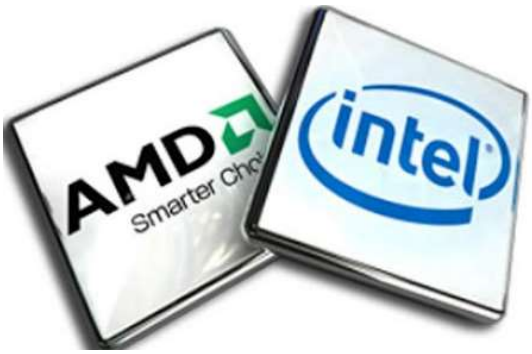
There are two types of sponsors on the market which is mainly motherboard that is specially designed for AMD CPU only or motherboard that only will work with Intel CPUs. There are more high-end models in the motherboard, more slots, and better release performance for the CPU. For example, for AMD CPU-compatible motherboard, X series motherboard is better than B series. Motherboards with better performance releases, more slots, and more high-end models usually have more expensive prices for some famous brands (like ASUS, MSI). But there is an exception here. The motherboard is divided into large and small models, which does not mean that the larger motherboard has a more expensive price. On the contrary, the smaller motherboard has a higher price, because the smaller the motherboard, the more highly integrated the circuit, the more complex the manufacturing process, and the more expensive the price.

2. MEMORY

Memory 	**Function:** Memory is the storage space in the computer, where data is to be processed and instructions required for processing are stored. The term memory is often synonymous with the term primary storage or main memory. It contained chips connected to the system board. Besides, the memory is divided into a large number of small parts called cells. On the other hand, there are three well-known types of memory chips which are random access memory (RAM), read-only memory (ROM), and flash memory.
a) RAM 	**Function:** o Holds programs and data that the CPU is presently processing. o Volatile: RAM will lose its data content when the computer has powered off. o The combination of RAM and space on the hard disk which is called virtual memory enables a computer to be able to compensate for shortages of physical memory by transferring pages of data from random access memory to disk storage.
b) ROM 	**Function:** o To contain the permanent or semi-permanent data. o Non – Volatile: ROM will not lose its data content when the computer has powered off. o Example: BIOS consists of a few kilobytes of code that tell the computer what to do when it starts up.

c) Flash Memory 	**<u>Function:</u>** o Long-life and non-volatile storage chip that is widely used in embedded systems. o keep stored data and information even when the power is off. o It can be electrically erased and reprogrammed.
Differentiate & Price: As other computer components increased their speed, memory speed also needed to increase. The double data rate (DDR) was developed and proved to be a faster and energy efficient RAM than Synchronous dynamic random-access memory (SDR). The next generation of computer's random-access memory - DDR2, is significant faster and more energy saving than the predecessor -DDR. DDR3 and DDR4 continued this trend. Each new generation can operate at a higher memory speed and uses less energy. Without going to say, the memory that performs faster by using less amount of energy, the higher the price for the memory.	

3. MICROPROCESSOR

Central Processing Unit (CPU)  	**Function:** CPU mainly serves to retrieve, execute instructions and to process data. a. Arithmetic Logic Unit (ALU) • All the computing is done here, like addition, subtraction, multiply (except division), b. Control Unit (CU) • Responsible for the control of the entire computer, including access to instructions, analysis of instructions and requirements, transmission of computing results to different ports, so that both inside and outside the processor can coordinate the work. c. Cache • To improve efficiency of the CPU by storing some important temporary data inside CPU cache rather than RAM. d. Clock Speed • The speed of the processor to fetch and process data. • Higher the clock speed, the faster the CPU to able to process the information. e. Multicore Chips • Multicore chip means that 2 or more separate CPU are within a unit and the higher the number of cores, the more tasks and processes the CPU can carry out at the same time. • The CPU can able to divide the tasks into parts and process it in every core.

f. Specialty Processors [Graphics Processing Unit (GPU)]
   - GPU is the microprocessor that can be found on every graphics card to handle specific operations.
   - Improve some specific operations especially the graphical intensive application, video editing, 3D modelling, gaming, data encrypting and AI simulations.

Popular Brands:

1) CPU: AMD and Intel
2) GPU: AMD and Nvidia

Differentiate &Price:

For CPUs, the pricing goes up with the type of the model. Usually, processors with more cores such as AMD Ryzen 9, Intel i9 would of course be more expensive than processors such as AMD Ryzen 3,5,7 and Intel i3,5,7. Same goes with GPU, more newer models offer more performance thus the pricing would be significant high compared to older models.

4. POWER SUPPLY, CABLES & TV TUNER

<table>
<tr>
<td>Power Supply
 
</td>
<td><u>Function:</u>
o To supply electricity for the computer hardware components.

<u>Popular Brands:</u>
o CoolerMaster, Corsair, Thermaltake, Antec, EVGA, Seasonic</td>
</tr>
<tr>
<td colspan="2">Differentiate & Price:

Wattage (W) is the base number to help you to differentiate and rating the quality of power supply. Nowadays, the Wattage(W) is common at 400-1000W. Type of the power supply mostly are AT and ATX. AT power supply is the original power that most of the older computers used. The ATX power supply is the newer and more power efficient design, so ATX is using commonly in nowadays. The higher price of the power supply, the better the quality as a good quality of power supply will also help to saving the electricity due to a higher efficiency rating (Silver, Bronze, Gold, Platinum, Titanium).</td>
</tr>
<tr>
<td>CABLES</td>
<td><u>Function:</u>
o Cables are used to connect monitors, keyboards, printers, hard drives, and other external devices to computer.

o Different type of cable will have different function:
• Networking: Ethernet Cable (RJ45 Cable).

• Data Transferring: USB cable, Thunderbolt cable.

• Video & Audio: HDMI cable.</td>
</tr>
<tr>
<td>TV TUNERS</td>
<td><u>Function:</u>
o Allows television signals to be received by a computer.

o Function as digital video recorder (DVR) to record television programs onto a hard disk

<u>Popular Brands:</u>
o Hauppauge, AVerMedia and SiliconDust.</td>
</tr>
</table>

5. GROUP DISUCSSION VIDEO LINK

The group discussion video was recorded on 27/10/2021 and all the group members has attended to the group discussion. The content of the group discussion video involved the discussion of components and accessories for the system unit and a demonstration of the component installation process by using the application “PC Building Simulator”.

YOUTUBE VIDEO LINK: https://www.youtube.com/watch?v=Da92qMwv9iU

Components in computer