SCHOOL OF COMPUTING
Faculty of Engineering

Semester I 2020/2021

Subject   : Technology and Information Systems
                   (SECP1513)

Section   : 07

Task   : Step by step Basic PC Assembly

Due date   : 1/12/2020 (Report)

Objectives:

1. Identify and distinguish basic components of CPU
2. Understand functions of the CPU basic components
3. Understand the process to assemble a PC
4. Demonstrate the assembly of a PC

1		Name : Nur Afikah Binti Mohd Hayazi Matric Number : A20EC0220 Phone Number : 011-72397812 E-mail : afikah2001@graduate.utm.my
2		Name : Ethan Leong Yi Thian Matric Number : A20EC0033 Phone Number : 011-2772 9757 E-mail : ethan@graduate.utm.my
3		Name: Ahmad Nazran bin Yusri Matric Number: A20EC0179 Phone Number: 010-4439026 E-mail : ahmadnazran@gradute.utm.my
4		Name : Megat Irfan Zackry Bin Ismail Matric Number : A20EC0205 Phone Number : 01111934097 E-mail : megatirfanzackry@graduate.utm.my

Part A : Tools needed to build a PC
1.0

Figure 1

Phillips-head Screwdriver

This Phillips-head screwdriver is the most used tools in building a PC as most of the screws in computers used are Phillips-headed. This tool is used to strip in screw heads at the component of the PC so that its locked in tight to the PC chassis. Without this tool, you would not be able to build a PC. To make it better, a Phillips-head screwdriver with magnetic tip will make it easier to extract screws, strip in screws at tight places and so that screws do not fall off into the PC chassis that will be hard to find. Not just that, a screwdriver with ratcheting mechanism makes it less fatiguing on the wrist while undertaking the task. In the diagram above, you can see that there many heads provided that can be use with this screwdriver that will only come in handy when needed.

2.0

Figure 2

Precision Screwdriver

This precision screwdrivers are used to work on small, intricate screws. This tool is very convenient as it has a small and light form factor and a sleeker handle design. Precision screwdrivers are usually used to assemble screws at the motherboard because the screws needed at the motherboard commonly have small heads. You never really know when having a variety of screw heads will come in handy.

3.0

Figure 3

Needle Nose Pliers

Next, the tools needed to assemble a PC is a needle nose pliers. The function of this tool is to cut, hold or bend broken part of steel. This tool is very important as it can aid in pulling cables in tight spot to make clearance for hardware components. Secondly, it can also be used to cut remaining zip ties so that it will look tidy. Besides that, this pliers can also be use in bending back broken part of steel hardware such as bent PCIe brackets.

4.0

Figure 4

Magnetic Screw Tray

This magnetic screw tray functions to hold screw and many other metal objects securely. By using this magnetic screw tray, metal objects (screws) will no longer fall off or went missing as it's attached to the tray with the magnet placed under the tray. This tool is very convenient because when you are building a pc, it involves many types of screws with different sizes and different purposes. So when you have this tool, you can see clearly the screws u needed and it will make your life easier as every screws is at one spot only and the screws will not slip off the tray.
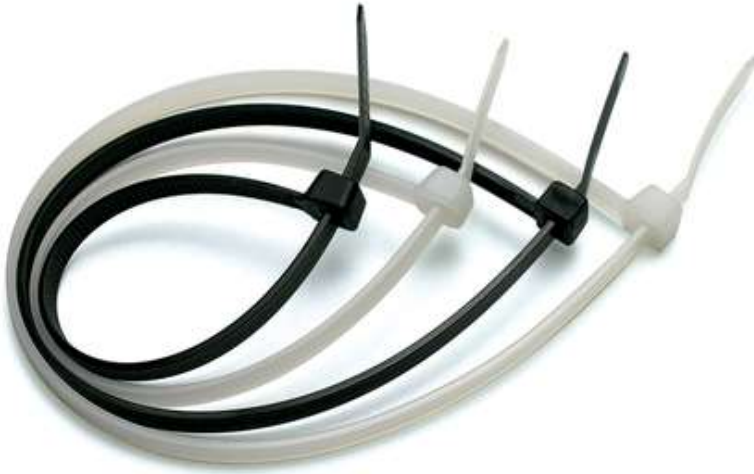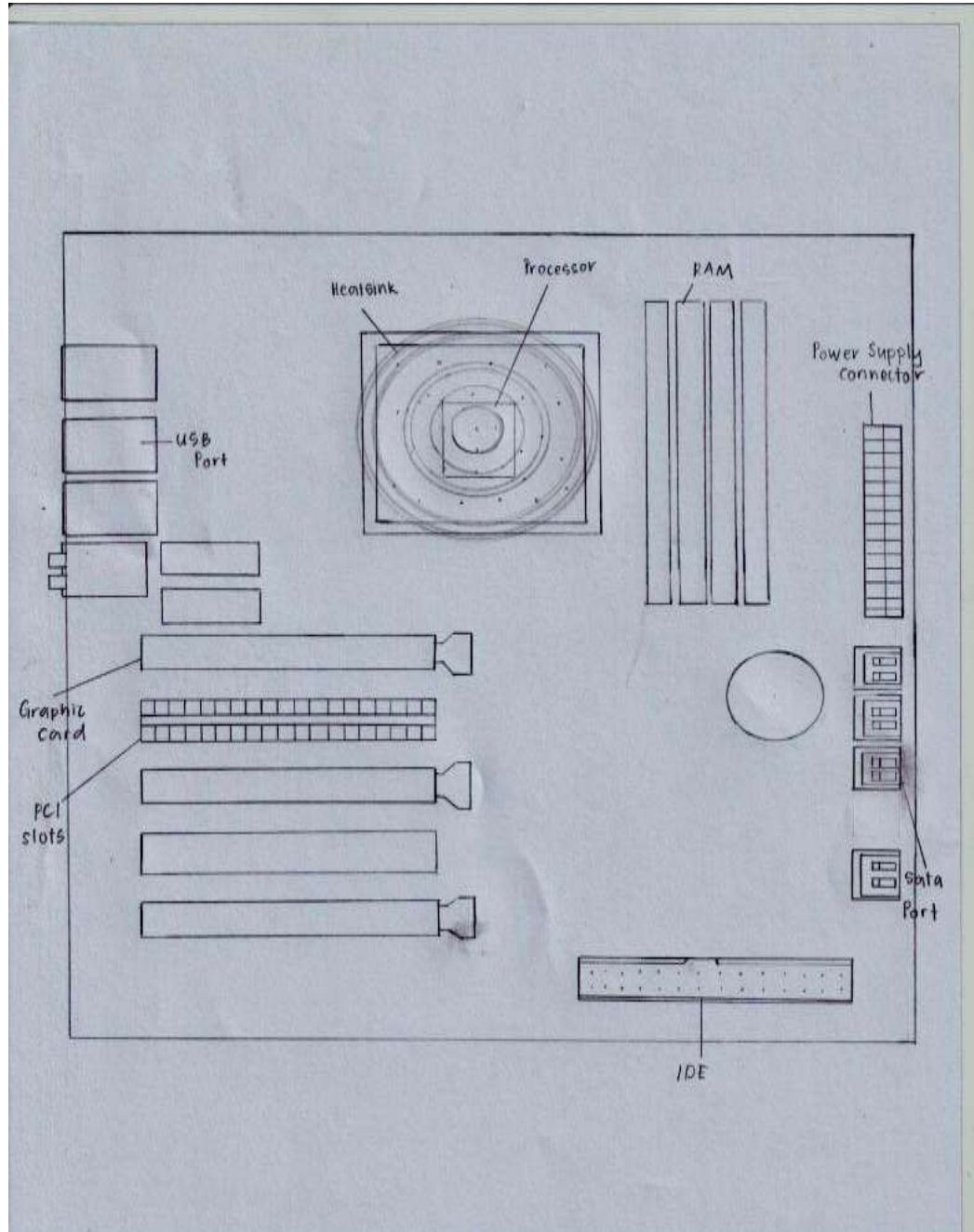
5.0

Figure 5

Cable Ties

This cable ties are used to improve cable management in the PC. When you have a good cable management, it will make it easier when performing other task such as screwing the hardware components into the PC, tidying up all the components and overall make the inner PC looks better and neat.

Part B : Sketch of a mother board layout

1.0

Heatsink
Processor
RAM
Power Supply connector
USB Port
Graphic card
PCI slots
Sata Port
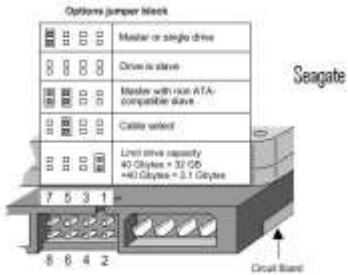IDE

2.0

Keywords	Functions	Example of models
Graphic card	A Graphics Card is a piece of computer hardware that produces the image you see on a monitor. The Graphics Card is responsible for rendering an image to your monitor, it does this by converting data into a signal your monitor can understand.	• AMD Ryzen Threadripper Graphics Card Video. • PowerColor Devil Graphics Card Video. • GeForce GTX 1080 Ti Graphics Card Video. • GeForce GTX 980 Ti Graphics Card Video.
USB cable	USB stands for Universal Serial Bus, an industry standard for short-distance digital data communications. USB ports allow USB devices to be connected to each other with and transfer digital data over USB cables. They can also supply electric power across the cable to devices that need it.	• USB Type-A • USB Type-C • Lightning cable • Micro-USB cable
IDE cable	IDE, an acronym for Integrated Drive Electronics, is a standard type of connection for storage devices in a computer. Generally, IDE refers to the types of cables and ports used to connect some hard drives and optical drives to each other and to the motherboard.	• Parallel ATA • Serial ATA

CPU / Processor	CPU is considered as the brain of the computer. CPU performs all types of data processing operations. It stores data, intermediate results, and instructions (program). It controls the operation of all parts of the computer.	• Core i3 • Core i5 • Core i7 • Core i9 • Xeon • Core Duo • Core Solo.
Power supply	A power supply unit (PSU) converts mains AC to low-voltage regulated DC power for the internal components of a computer. Modern personal computers universally use switched-mode power supplies. Some power supplies have a manual switch for selecting input voltage, while others automatically adapt to the mains voltage.	• AT standard • IBM PC power supply unit • ATX power supply
Heat sink	A heat sink is a thermal conductive metal device designed to absorb and disperse heat away from a high temperature object such as a computer processor. Usually heat sinks are outfitted with built-in fans to help keep both the CPU and the heat sink at an appropriate temperature.	• Extruded Heat Sinks • Bonded Heat Sinks • Skived Heat Sinks • Stamped Heat Sinks • Forged Heat Sinks • CNC Machined Heat Sinks

RAM	Computer random access memory (RAM) is one of the most important components in determining your system's performance. RAM gives applications a place to store and access data on a short-term basis. It stores the information your computer is actively using so that it can be accessed quickly.	• DDR SDRAM • DDR2 SDRAM • DDR3 SDRAM
Hard disk (jumper setting either master/slave)	Slave drives are mostly used for storing data to protect it in the event of a system crash. Master drives usually contain the operating system to run the computer. Computers without a secondary drive set as a slave drive will store their data on the main (only) hard drive, alongside the operating system.	• Maxtor ATA Hard Drives • WD SATA Internal Hard Drive
CD ROM	(Compact Disc-Read Only Memory) A type of CD disc that can only be read, but not recorded. Used to store programs and data files, a CD-ROM holds 650MB or 700MB of data and employs a different recording format than the audio CD (CD-DA), from which it evolved.	• Model brand: -Lite-On -Mitsumi -NEC -Samsung -Sony

SATA cable	SATA (Serial Advanced Technology Attachment) cables connect hard drives and optical drives to computers. These cables let the drives exchange data with the computer through the motherboard. While SATA drives perform at higher speed, the data they transfer is exactly the same as for the older cables.	• SATAII • SATAIII • ESATA • MSATA

Part C : Step by step PC assembly

Steps building computer case

Step 1: Open the case

1. Unscrew side cover and remove it as *Photo 1*. Then ,put case laying sideways on a flat surface as *Photo 2*.

Photo 1

Photo 2

Step 2: Preparing a complete motherboard

1.	Lift the latch level to open the CPU socket as *Photo 4*. Place the CPU/Processor gently by lining up the alignment notch of CPU with the triangle marked on the CPU socket to ensure correct orientation as *Photo 5*. Then, lower the latch level gently to hold and lock the CPU/Processor as *Photo 6*.
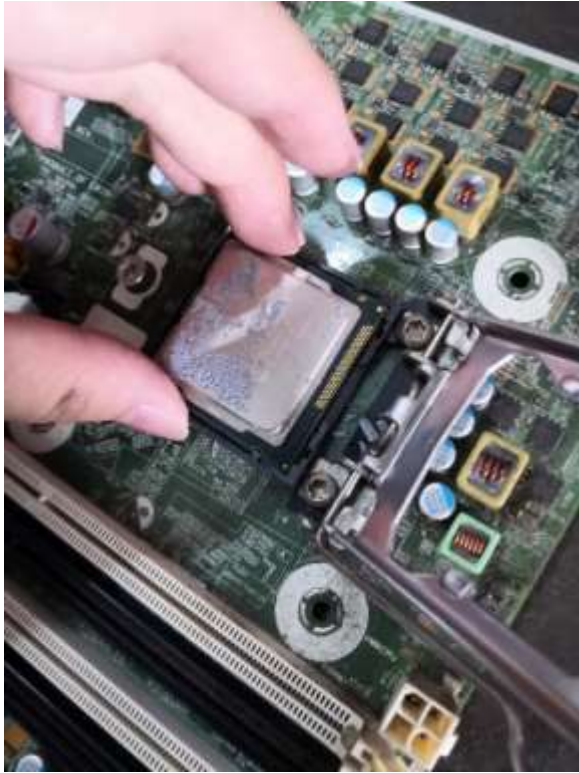

Photo 3-Motherboard
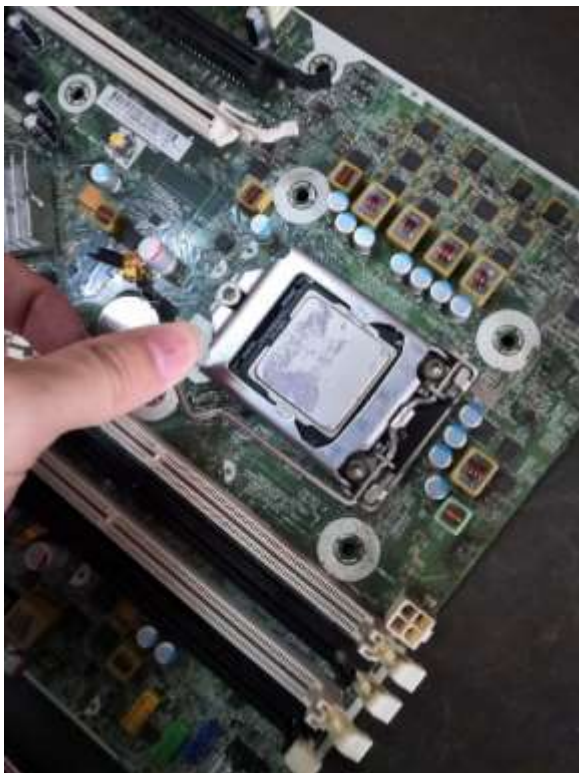

Photo 4

Photo 5

Photo 6

Photo 7-Locked CPU socket from above view

2.   Apply thermal paste on back of the CPU/Processor as *Photo 8*. Place heat sink on the CPU socket and fix in position as *Photo 9*.
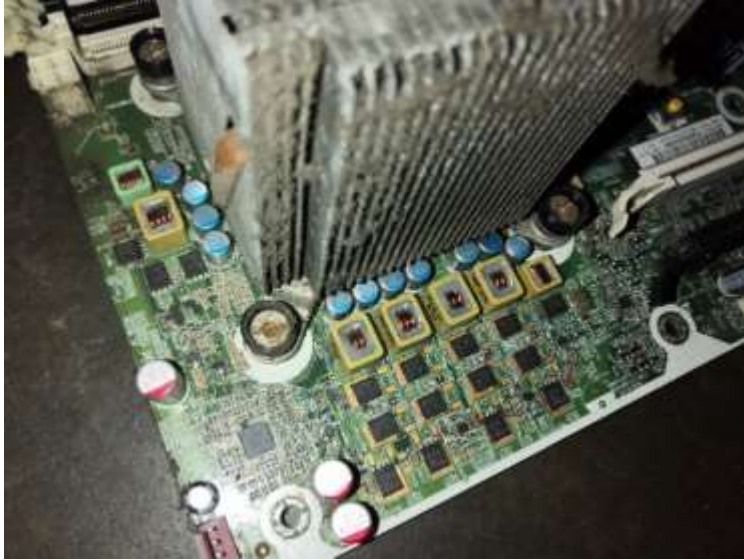

Photo 8

Photo 9

Photo 10-Locked heatsink from above view

3.   Press to open both clips of the RAM mounting slot as *Photo 11*. Place the RAM by matching both alignment notch of both RAM and RAM mounting slot to ensure correct orientation as *Photo 12*. Install the RAM by pressing down gently the RAM into the slot until the clips lock on the RAM.

Photo 11

Photo 12

Step 3: Mount motherboard in computer case

1. Screw motherboard standoffs into the case which case positions is matched to the mounting holes on the motherboard. Screw the motherboard with correct orientation that match the ports of I/O plate as *Photo 14*

Photo 13- Placing motherboard into PC case

Photo 14

Photo 15-Screwed motherboard from above view

Step 4: Install power supply

1.   Place the power supply as *Photo 16* and screw to fix the position at the case mounting point as *Photo 17*

Photo 16

Photo 17

2.   Plug the largest cabling connector from power supply into motherboard power connector. Then, plug 8-pin cabling connector from power supply cabling into the CPU power connector. Shown as *Photo 18*

Photo 18

Step 5: Install graphic card

1.   Remove expansion slot of the graphic card as *Photo 19*

Photo 19

2.   Line up the graphic card with the PCI expansion slot below motherboard and press down the graphic card gently along the removed graphic card slot as *Photo 20*.

Photo 20

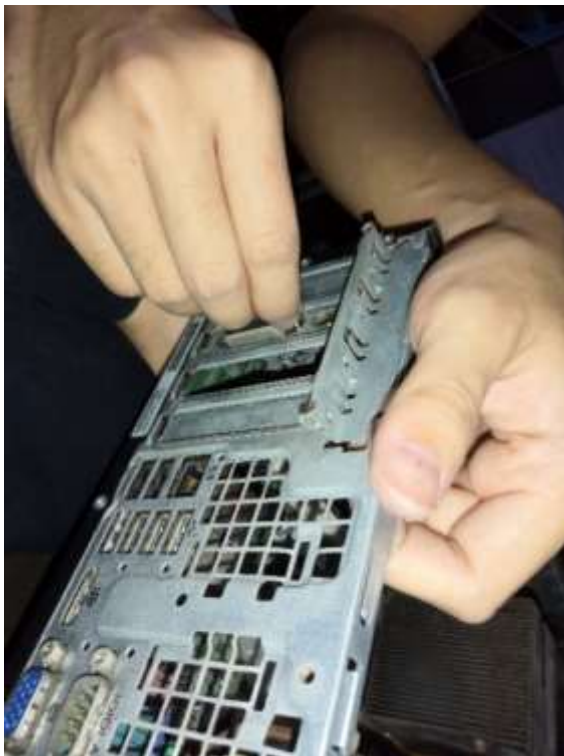3.   Screw to lock on the graphic card in the position as *Photo 21*

Photo 21

4. Connect power connector cables from power supply into the graphic card power connector as *Photo 22* and *Photo 23* (optional for different graphic cards)
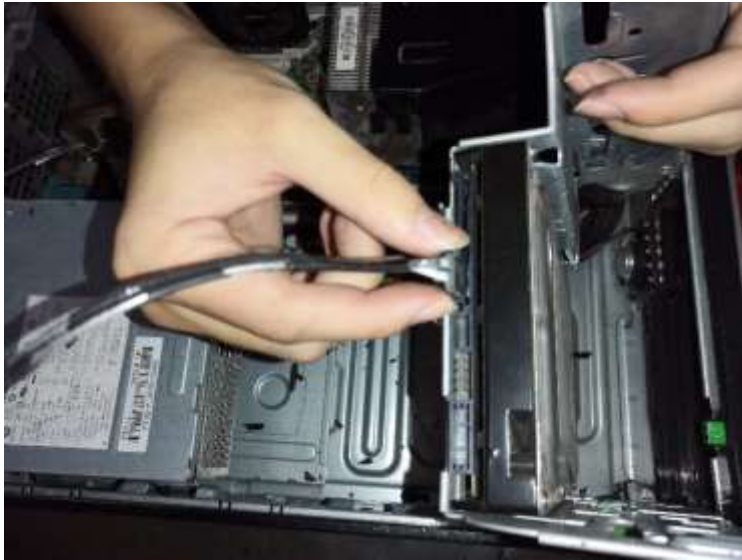

Photo 22

Photo 23

Step 6: Installing hard disk

1.   Place the hard disk in the case drive bays as *Photo 24* and screw through case frame into the case mounting holes on the storage drive as *Photo 25*.

Photo 24

Photo 25

2.   Plug in a IDE/SATA cable at both side IDE/SATA slot on the motherboard and hard disk. Plug in power cabling to the hard disk as Photo 26.
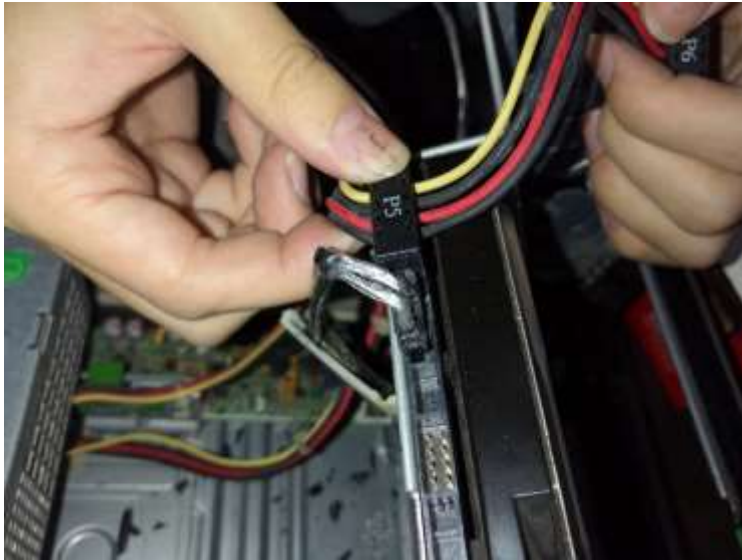

Photo 26

Step 7: Installing CD ROM

1.   Remove front case panel. (Optional for different PC case as some doesn't have case)

2.   Place CD ROM in the case panel and screw the case frame into the case mounting holes on CD ROM as *Photo 27*.

Photo 27

3.   Plug in a SATA cable at both side SATA ports on motherboard and hard disk. Plug in power cabling to the CD ROM. Shown as *Photo 28* and *Photo 29*
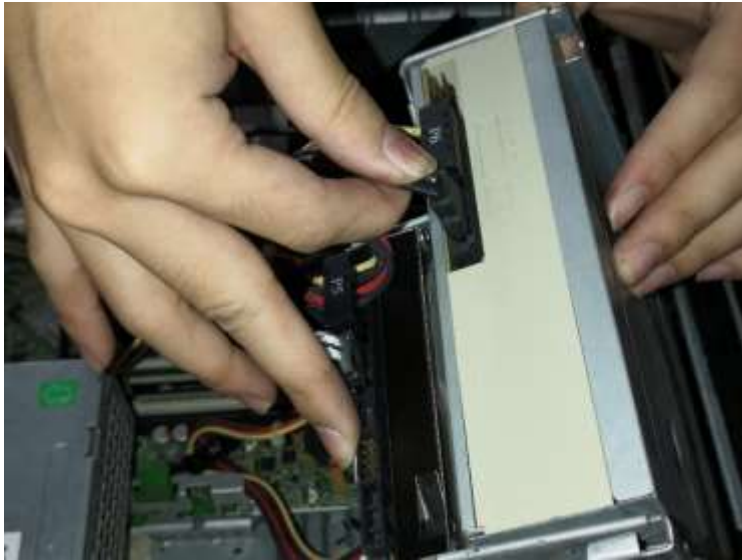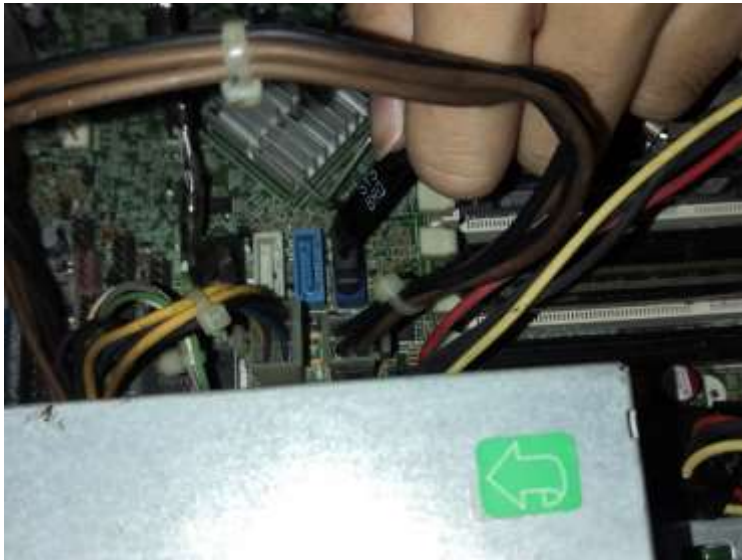

Photo 28

Photo 29

Step 8: Close the case and connect the peripherals.

1.   Place the side cover back on and secure the side panels with case screws. Shown as *Photo 30*.

Photo 30

2.   Connect peripheral devices include keyboard, mouse, wireless network dongle, printer and webcams with your CPU by plugging into USB port. Shown as *Photo 31*.

Photo 31

3.   Then, connect speakers and microphone which into 2.5 mm sockets. Shown as *Photo 32*.

Photo 32

4. Finally connect the CPU with monitor by plugging into display ports and power supply. Shown as *Photo 33 and 34*.

Photo 33

Photo 34