STRAND	**13.2 Computers and Application**
SUB-STRAND	**13.2.1.1Hardware, software installation and basic networking**
CONTENT LEARNING OUTCOME	**Reasons for installing hardware and software**
REFERENCE FROM TEXTBOOK	Pg. 57-58

Achievement Indicators
Reasons for Installing hardware and software
a) Routine maintenance
- **Routine maintenance is where old hardware is replaced before it wears out or breaks down.**
  .For example broken equipment can cost a business a lot of money in terms of time wasted and lost business.
b) **Fault repair**
- **If equipment develops a fault or break down, it needs to be repaired or replaced**.
- For example the computer systems it is often sensible to replace the components that break, rather than replacing the whole system.
- For example, if a keyboard develops a fault after a user spills coffee over it or a DVD drive becomes unreliable, the cost of replacing the component will be less than the cost of replacing the whole computer system.

c) Upgrade
- **An upgrade is when a component is installed into a computer to improve performance**.
- For example, upgrade often means that an existing component is replaced with a new one, but sometimes the upgrade will add to existing components. For example, a new memory stick (RAM) may be fitted into an empty socket, with the existing RAM.

Example 1

What are the reasons for upgrading and installing new hardware components?

. Reasons for upgrading:
- • User requirements
- • Compatibility
- • Increased capacity
- • Increased speed
- • Software requirements.

Example 2

What consequences might there be if an IT system breaks down?

IT support technicians are rarely able to just swap over hardware components, as organizations demand a more professional approach which involves planning, preparation and testing

Summary

ACTIVITY   QUESTIONS

1. Complete the following

a)   _____ maintenance is where old hardware is replaced before it wears out or breaks down.

b) An upgrade is when a component is installed into a computer to improve _____.

c) Good reasons for installing new hardware components include routine maintenance, _____ and upgrade.

WEEK 2: MONDAY 12/07 TO FRIDAY 16/07

SUB-STRAND	13.2.1.1Hardware, software installation and basic networking
CONTENT LEARNING OUTCOME	Apply proper safety procedures
REFERENCE FROM TEXTBOOK	**Pg 59-61**

Achievement Indicators
- apply proper safety procedures.

Electrostatic discharge (ESD) is a phenomenon that occurs when the charges on separated objects are unequal. One object has an excess positive or negative
For example, PC technician, statically charged objects are brought near each other. When that happens, a current can flow between them to balance their charges.
Electrostatic discharges aren't dangerous to humans but are potentially harmful to electronics.
Electronics can be damaged by a 30-volt discharge or

i.   **To reduce/ prevent the build-up of static charges, follow these tips:**

- Don't shuffle your feet as you walk

- Increase the humidity in the room or building to 50 to 60%- static charges can dissipate before growing large if the humidity level is sufficiently high.

- Keep yourself grounded as you work or move around.

- Wear cotton clothing which is less likely to generate static

- charges than is clothing of many synthetic materials.

- Remove carpeting from rooms where you service computers and from computer rooms.

Preventing static discharge

- If a charge differential builds up, you can follow the following tips to prevent or reduce the likelihood of damage from static discharges:

- Equalize the charge safely. Unplug the equipment and then touch a metal portion of its chassis.

- Do not leave the computer plugged in while servicing it.

**REF
https://www.youtube.com/watch?v=6YcBJY29Ju4**

Preventing problems with static electricity.

i.   Prevent the build-up of static charges
ii.   Prevent discharges or discharge the charge safely. Preventing static build-up

Example 1

Label and explain the ways to avoid static electricity

Electrostatic wrist strap
If you move around as you work, keep yourself grounded with an antistatic wrist strap so that charges can't build up

Example 2

Antistatic mat
Always service computers on properly grounded bench. Computer equipment should be protected from static electricity.

ACTIVITY

Activity 1

Explain why data is usually the most valuable part of a computer system?

Activity 2

What planning might an ICT professional do to prepare for a hardware and software installation

Activity 3

Computer maintenance is the practice of keeping computers in a good state of repair. With reference to the above statement, discuss three: precautionary measures taken while handling static charges

WEEK 3: MONDAY 19/07 TO FRIDAY 23/07
Achievement Indicators: Identify common hardware components

1.Memory card [RAM]
- **Memory (RAM) is temporary electronic storage, used to hold software and data when the software is running.**
For example this memory is very fast as it has no moving parts and works at the speed of electricity. It is also temporary (volatile) as data is lost when the computer is switched off.

2. The video card which is also known as a graphics card is a component that plugs into the motherboard.
- For example Its purpose is to make the picture signal to be displayed on the monitor.
- The video card has a socket on it for the cable used to take the signal to the monitor

3. **Network device**
- **Network devices are any hardware used with a network, such as a switch or router.**
For example a network device such as a network card may need to be replaced to increase the speed of the computer.

4. Ports
- **A port is a socket where I/O device can be connected to the system**, such as USB.
- A computer system may need new ports installing if there are not enough or if a different type of port is needed.

Serial Ports – **these ports allow data to travel in only one direction at a time – into the computer of out.** E.g. mouse, modems, monitors.
☐   These ports are also referred to as **COM** ports. (COM1, COM2, COM3, COM4).
☐   A computer should be able to accommodate around four COM (serial) ports locally. (9-pin male). Serial ports **transmit one (1) bit at a time – a relatively slow process**.

5 Hard drive

- **A computer's hard drive also known as a fixed or hard disk sometimes fails, but usually the reason for installing a hard drive is to upgrade to a larger drive for increased capacity**.

- Hard drive capacities are measured in gigabytes (GB) or terabytes (TB).

- Hard disks are available in various types: ESDI, IDE, SCSI.

ESDI (Enhanced Small Drive Interface): **consist of a controller card connected to an expansion**

6. IDE (Integrated Drive Electronics) – IDE hard drives have the disk controller circuitry integrated within the hard drive and does not need an additional controller card. The ribbon cables connect directly from the motherboard to the hard disk.
SCSI (Small Computer System Interface) – SCSI cards provide a high-speed parallel interface.They are usually in the form of expansion boards/ adaptors. These controller cards have the capability of connecting seven (7) hardware devices such as more hard disks, CD-ROMS, DVD-ROMS etc. SCSI cards save wastage of expansion

USB ports (Universal Serial Bus) – A new type of port that can accommodate new types of I/O devices.
This port supports **plug and play**. Once you attach a device, you don't have to restart the computer, as the computer will be able to detect the device and use it automatically

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b) Parallel Port – **these ports only transmit data to output devices namely printers**.
- o They are therefore printer ports.
- o Also referred to as **LPT** ports (LPT1, LPT2 or LPT3 - reserved names for printer ports in the CMOS) – **line printers** – a name used by the MS-DOS operating system and still in use today.
- o Most computers can accommodate three parallel ports locally. (25-pin female).
- o Parallel ports **transmit 8 bits at a time**.

ACTIVITY   QUESTIONS

FY13CE 2015

1. While starting the computer, an error message system disk or disk error" appears on the screen.

(i) Give a possible cause of this error.

(ii) How can the error be fixed?

2. What does the acronym SIMM stand for?

Example 1
 Describe memory card
A memory card also known as a RAM stick is a common hardware used to upgrade performance of the computer. More space in RAM gives increased capacity, without slowing the computer

Example 2
Differentiate between the two types of RAM (RAM) is temporary electronic storage, used to hold software and data when the software is running. This memory is very fast as it has no moving parts and works at the speed of electricity. It is also temporary (volatile) as data is lost when the computer is switched off .ROM-Read only memory

Example 3

Discuss the purpose of a video card. State an example.
The video card which is also known as a graphics card is a component that plugs into the motherboard. Its purpose is to make the picture signal to be displayed on the monitor. The video card has a socket on it for the cable used to take the signal to the monitor

|	
WEEK 4: MONDAY 26/07 TO FRIDAY 30/07	**Example 1**
	Discuss the motives behind a planned hardware installationBefore installing new hardware, you need to check the equipment carefully to make sure it is not damaged. Always look at the component packaging before opening to check for damage, and look for bent pins or breakages on components. Make sure that any tools you will use are in good condition

SUB-STRAND	13.2.1.1Hardware, software installation and basic networking
CONTENT LEARNING OUTCOME	**Common hardware components**
REFERENCE FROM TEXTBOOK	**Pg 62-69**

Installing Hardware Components- All good ICT professionals **plan their hardware installations** before they carry them out

- This makes **installations much quicker and more effective**.
- Planning **ensures that the ICT professional is properly prepared**, with the correct tools, access rights to make any necessary configuration changes, and a clear understanding of what needs to be done and how to check that the installation was successful.
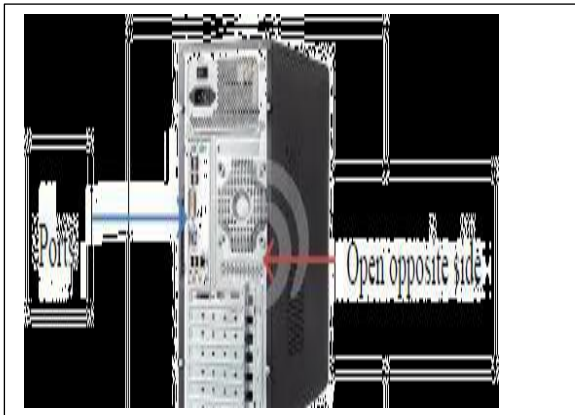
Example 2

.List the steps to take before installations could take place.The following tasks need to be carried out before any installation can take place:
- Test configuration
- Reading instructions
- Following procedures
- Safety check.

- Printers - a must-have   home office tool
- Installation has been significantly streamlined over the years.
- Most printers will install automatically.
- Adding the printer to a network or sharing the printer with other users requires administrator privilege and includes several steps for allowing permissions.

b) How to Install/Add a Local Printer in Windows OS – *(Steps only. For photos, refer to textbook)*

☐ Computer users have differing needs, for some printing is important. This installation assumes you have a <u>printer.</u>

Steps:

1) **Plug the printer into your computer.** Make sure to plug it into a serial/parallel or USB port directly on your computer. Some printers will need to be plugged into a power source as well. Turn the printer on. You should hear the page feed mechanism start and the printer should light up.
2) **Turn on your computer** and see if it detects your printer automatically.
3) If it does not appear automatically, go through the **Control Panel printer wizard**.
4) Click New, then printer to **launch the wizard**.
5) Choose your **connection type**.
6) Choose your **printer**.
7) Let it **searchSteps:**

1) **Power down the computer.** Shut off the power supply in the back. Even if you can access the inside where it stands, you need to unplug the computer.
2) Remove **the case panels.** You may need a screwdriver, but most new computers have thumbscrews. You will need to remove both sides so that you can screw the hard drive in on both sides.
3) Ensure **that you do not have any static electricity.** Touch a metal object (other than your computer), such as a doorknob, to discharge any existing static electricity that you may have.
4) **Remove the old drive (if applicable).** If you are removing an old hard drive, make sure all of the cables are disconnected from both the motherboard and the power supply.
5) Insert **your new drive. S**lide it into an open space in the hard drive housing. The drive should slide directly in, and the holes

.

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Example 1

Discuss the purpose of installing the printer driver
Printer drivers tell the operating system, and by extension whatever program you have the thing you want to print open in, *exactly* how to print information on the page
Example 2

 Why should you update printer drivers after installation?
Printers have quickly become a must-have home office tool, and their installation has been significantly streamlined over the years. While most printers will install automatically, adding the printer to a network or sharing the printer with other users can still be a bit tricky. Once you learn how to do it, you can even enable your printer to allow you to print from anywhere in the world!

Example 3

How is it possible for printers to work in windows without even having to install the driver yourself?

Most printers will install automatically, adding the printer to a network or sharing the printer with other users

on the side of the drive should line up to the screw guides on the housing.

6) Secure **the hard drive.** Once the hard drive has been inserted, use the screws that came with it to secure the hard drive in the housing. Ideally you should use two screws on each side of the hard drive. If the hard drive is loose, it can rattle and cause more noise and lead to physical damage.

7) Connect **a SATA/IDE hard drive to the motherboard.** Newer hard drives will use **SATA cables**, which are thin and resemble USB cables. Use a SATA cable to connect the hard drive to the motherboard. IDE Drives are connected via an **IDE cable**, which is wide and flat. The cable is usually grey in colour.

8) Connect **the power supply to the hard drive.** Most new power supplies have SATA power connectors, though older power supplies typically only have Molex (4 pin) connectors. Make sure that all of your connections are secure.

Close up your computer. Replace the case sides and reconnect your cables if you had to move the case to work on the inside. Turn the power supply back on and then turn your computer on.
Installation complete.

ACTIVITY QUESTION

REF: 2018 PAPER

There must be a good reason for an organization to decide to spend money on installing new hardware components and software.

Differentiate between hardware components and hardware devices.
- One reason for installing new hardware components is upgrade. Identify the other two.
- Describe the activities that take place in the two reasons identified above.
- Identify and discuss two reasons for upgrading components of a computer.

WEEK 5: MONDAY 02/08 TO FRIDAY 06/08

SUB-STRAND	13.2.1.1Hardware, software installation and basic networking
CONTENT LEARNING OUTCOME	Installation of Memory (RAM)
REFERENCE FROM TEXTBOOK	Pg 70-71

REF
https://www.youtube.com/watch?v=v3J9VtWMEE8
https://www.youtube.com/watch?v=t5zBN8smwTM

How to Install Memory (RAM) – *(Steps only. For photos, refer to textbook)*

When to upgrade RAM?
Computer is sluggish.

It's not performing like it used to.
Can't keep up with the latest software.

Upgrading your RAM (Random Access Memory) is one of the simplest and cheapest ways to quickly improve your computer's performance.

RAM can be upgraded on virtually any computer.
RAM is available as DDR (double data rate), DDR2, and DDR3.
Most new computers use DDR2 or 3.
You must get the type that matches what your motherboard supports.

c) **How to Install Hard drive** – *(Steps only. For photos, refer to textbook)*

- **The hard drive is the primary storage location for all of your computer's data**.
- If you run out of that storage, installing a new drive may be the most practical solution.

- Also identify the **jumper settings** of the drive. Jumper pins can be found at the back of the disk (sometimes on the motherboard). **Jumper pins are used to change the function of the disk**. It will enable the disk to become the **master disk** – **one that is used for booting.** A different setting of jumper pins will identify the disk as a **slave disk** – **one that is merely used to store data**.

a) Hard disks are available in various types: ESDI, _____ and SCSI.

b) The installation process for software depends on your _____ and the program you are installing.

c)A _____ is a small piece of software that tells the operating system and other software how to communicate with a piece of hardware.

d) _____ that make copies of files to be used in case the originals are lost or damaged.

How to install an Optical Drive–
(Steps only. For photos, refer to textbook)

- A DVD burner is an optical drive that can read as well as write DVD disks.

- You may want to install a DVD burner internally to increase the input and output speed of data transferred between your computer and the DVD drive.

- An internal drive is usually the fastest and most reliable way to burn a DVD even though the initial installation is more complicated

ACTIVITY QUESTIONS

ESSAY YR 2016
Hardware components such as the hard disk, memory or processor are parts of the computer.
With reference to the above statement, discuss:
three main reasons for installing new hardware components
- ➢ **two** hardware components that can be upgraded to increase the computer capacity.
  (2 marks)
- ➢ **two** things a computer technician should do while dismantling a computer.
  (2 marks)

- ➢ what happens when the computer is switched on. **(2 marks)**

Example 1

Discuss the difference between a installation of RAM and optical drive

Optical drive is usually the fastest and most reliable way to burn a DVD even though the initial installation is more complicated

Example 2

How to Install Hard drive

The hard drive is the primary storage location for all of your computer's data. If you run out of that storage, installing a new drive may be the most practical solution. Also identify the **jumper settings** of the drive. Jumper pins can be found at the back of the disk (sometimes on the motherboard). Jumper pins are used to change the function of the disk. It will enable the disk to become the **master disk** – one that is used for booting. A different setting of jumper pins will identify the disk as a **slave disk** – one that is merely used to store data. If your computer is dead, you may need to replace your old failed hard drive