

Web Development and Database Administration Level-I

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Table of Contents

Acknowledgment	3
Acronyms	4
Introduction to the Module	5
UNIT ONE: CONFIRM REQUIREMENTS OF CLIENT	6
1.1 Basic introduction to computer	7
1.2 Documenting and reporting client requirements	15
1.3 Verifying client requirements	16
1.4 Taking action to ensure client support expectations	17
Self-check -1	18
UNIT TWO: CREATE DOCUMENT STRUCTURE	19
2.1 Obtaining peripherals	20
2.2 Entering peripherals into equipment inventory	21
2.3 Storing Peripherals according to vendor manual guidelines	22
Self-check #2	23
UNIT THREE: CONNECT HARDWARE PERIPHERALS	24
3.1 Considering environmental and OHS standard	25
3.2 Removing and/or replacing old peripherals	26
3.3 Configuring operating system to accept the new peripherals	27
3.4 Testing and confirming hardware peripherals	31
Self-Check 3	32
Operation Sheet 3.1 adding local printer	33
Lap Test 3	36
UNIT FOUR: CONNECT A WORKSTATION TO THE INTERNET	37
4.1 Communication with ISP and telecom service organizations	38
4.2 Selecting the right type of internet service provider	38
4.3 Connecting workstations to the internet	39
4.4 Launching internet browser software	42
Self-check -4	43
Operation Sheet 4.1 configuring internet to use internet	44
Lap Test #4	47
Reference	48

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Page 3 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

Acronyms

ADSL	Asymmetric Digital Subscriber Line
ALGOL	Algorithmic Language
CAD	Computer aided design
COBOL	Common Business Oriented Language
FORTTRAN	Formula Translation
ISP	internet service provider
PC	Personal computers
PSTN	public switched telephone network

Introduction to the Module

In computer hardware is the physical components that a computer system requires to function. It encompasses everything with a circuit board that operates within a PC or laptop; including the motherboard, graphics card, Central Processing Unit, ventilation fans, webcam, power supply and peripherals. A peripheral is a piece of computer hardware that is added to a computer in order to expand its abilities.

This module is elaborate internal and external hardware components of a computer under web development and database administration occupational standard, particularly for the unit of competency: **Connecting hardware peripherals.**

This module covers the units:

- Client requirements
- Required peripherals devices
- Connecting hardware peripherals
- Connecting workstation to the internet

Learning Objective of the Module

- Confirm requires of client
- Obtain required peripherals
- Connect hardware peripherals
- Connect workstation to the internet

Module Instruction

For effective use these modules trainees are expected to follow the following module instruction:

1. Read the information written in each unit
2. Accomplish the Self-checks at the end of each unit
3. Perform Operation Sheets which were provided at the end of units and
4. Read the identified reference book for Examples and exercise

Page 5 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

UNIT ONE: CONFIRM REQUIREMENTS OF CLIENT

This unit is developed to provide you the necessary information regarding the following content coverage and topics:

- Basic Concepts of computer
- Identifying and confirming client's peripherals requirements
- Documentation and reporting client requirements
- Verify client requirements
- client support expectations

This unit will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Understand characteristics, generation and types of computers
- Prepare documentation and reporting of client requirements
- Identify and confirm client's peripherals
- Verify client requirements
- Ensure client support expectations

1.1 Basic introduction to computer

1.1.1 Understanding history, generation and types of computers

Definition of computer

A **computer** is an electronic device that manipulates information, or "data." It has the ability to store, retrieve, and process data. You can use a computer to type documents, send email, and browse the internet. You can also use it to handle spreadsheets, accounting, database management, presentations, games, and more for beginning computer users.

Data is a collection of unorganized facts & figures and does not provide any further information regarding patterns, context, etc. Hence data means "unstructured facts and figures".

Information is a structured data i.e. organized meaningful and processed data. To process the data and convert into information, a computer is used. Computers consist of two basic parts:

Hardware is any part of your computer that has a physical structure, such as the computer monitor or keyboard.

Software is any set of instructions that tells the hardware what to do. It is what guides the hardware and tells it how to accomplish each task. Some examples of software are web browsers, games, and word processors such as Microsoft Word. Anything you buy for your computer can be classified as either hardware or software. Once you learn more about these items, computers are actually very straightforward.

Characteristics of computer

A computer has a lot of features or characteristics but in all those characteristics 5 are the most popular.

Speed: computer can work very fast. It takes only few seconds for calculations that we take hours to complete. You will be surprised to know that computer can perform millions (1,000,000) of instructions and even more per second.

Therefore, we determine the speed of computer in terms of microsecond (10^6 part of a second) or nanosecond (10^9 part of a second). From this you can imagine how fast your computer performs work.

Page 7 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
--------------	--	------------------------------------	-------------------------------

Accuracy: Accuracy of a computer is consistent. Computer gives us accurate result or calculation. Error occurs in result for any calculation in a computer is only due to wrong program or instruction, inaccuracy in input data etc. You can directly say that errors in computers can happen only due to human beings. Otherwise, the accuracy of a computer device is constantly high.

Consistency: Computer is a consistent machine; it means that computer never gets tired of working more. You can use computer to perform your task without any error for any number of hours, any number of hours means you can use your computer system continuously for 24 hours a day and 365 days a year.

Storage: The Computer has an in-built memory where it can store a large amount of data. You can also store data in secondary storage devices such as floppies, which can be kept outside your computer and can be carried to other computers.

Flexibility: means that a computer can work in many areas like you can use your computer system to:

- Watch movies or videos
- Listen sounds or music's
- Play games
- See pictures
- Write textual documents and save
- Open and read anything

Generation of computer

Generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper more powerful and more efficient and reliable devices. The various generations of computers are listed below

First Generation (1946 to 1954): In 1946 there was no 'best' way of storing instructions and data in a computer memory. The digital computers using electronic valves (Vacuum tubes) are known as first generation computers. The first 'computer' to use electronic valves (i.e. vacuum tubes). The high cost of vacuum tubes prevented their use for main memory. They stored information in the form of propagating sound waves.

Limitations of First-Generation Computer

Followings are the major drawbacks of First generation computers.

Page 8 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

- They used valves or vacuum tubes as their main electronic component.
- They were large in size, slow in processing and had less storage capacity.
- They consumed lots of electricity and produced lots of heat.
- Their computing capabilities were limited.
- They were not so accurate and reliable.
- They used machine level language for programming.
- They were very expensive

Second-generation computer (1955 to 1964): - used transistors for CPU components. They used high-level languages such as FORTRAN; ALGOL & COBOL. I/O processor was included to control I/O operations. Around 1955 a device called Transistor replaced the bulky Vacuum tubes in the first-generation computer. Transistors are smaller than Vacuum tubes and have higher operating speed. They have no filament and require no heating. Manufacturing cost was also very low. Thus, the size of the computer got reduced considerably.

Advantages of second-generation computers

Here are some of the main advantages of using second generation computer at that time:

- Smaller in size as compared to the first-generation computers
- The second-generation computers were more reliable
- Used less energy and were not heated
- Wider commercial use
- Better portability as compared to the first-generation computers
- Beta speed and could calculate data in microseconds
- Used faster peripherals like tape drives, magnetic disks, printer etc.

Disadvantages of second-generation computers

- Cooling system was required
- Constant maintenance was required
- Commercial production was difficult
- Only used for specific purposes

Third Generation computer (1964 to 1975)

Page 9 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
--------------	--	------------------------------------	-------------------------------

Now another new technology named integrated circuits that is ICs came into existence and therefore the third-generation computer was also came into existence. The third-generation computers used the integrated circuits (ICs).

Benefits of using all those computers that was made up on the third generation over second generation:

Less costly

Consume less power

Small in size

Highly reliable

Advantages of third generation computers

Following are some main advantages of using third generation computers:

- Smaller in size as compared to previous generation
- More reliable
- Used less energy
- Better speed and could calculate data in nanoseconds
- Used fan for heat discharge to prevent damage

Disadvantages of third generation computers

Following are some main disadvantages of using third generation computers:

- Air conditioning was required
- Highly sophisticated Technology was required for the manufacturing of IC chips

Fourth Generation Computer (1975 to present)

Fourth generation computer starts from the year, 1971. At that time there was an invention of microprocessor chip that has created a revolution in the computer world.

The fourth-generation computers started with the invention of microprocessor. The microprocessor contains thousands of ICs. The size of modern microprocessors is usually 1 square inch. It can contain millions of electronic circuits.

Advantages of fourth generation of computers

Following are the advantages of using those computer machines that are based on fourth generation over previous generation:

- Much faster

Page 10 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

- Less expensive
- More powerful and reliable than previous generations
- Small in size
- Uses advanced techniques
- Have greater data processing capacity than equivalent size previous generation computer that is third generation computers
- Fast processing power with less power consumption
- Fan for heat discharging and thus to keep cold
- No air conditioning required

Fifth Generation Computer (Present to beyond)

Scientists are working hard on the fifth-generation computers with quick of few breakthroughs. It is based on the technique of artificial intelligence (AI).

All computer machines that will made on the basis of 5th generation computer will use parallel processing techniques and artificial intelligence. Parallel processing techniques and artificial intelligence are basically similar to the one used by our brain that is human brain.

Types of computers

Computers can be categorized on the basis of: size and data handling capabilities. Further, on the basis of data handling capabilities, computers can be divided into three types:

1. **Analogue computer:** They are designed so that they can process the analogue data. The data that can change continuously and do not have discrete values such as temperature, current, speed and pressure is known as Analogue data. The continuous changes that physical quantity goes through are measured by analogue computers. The output rendered by them is generally in the form of a reading on a dial or scale.

Analogue computers don't wait for the data to get converted into codes and numbers and rather accept the data from the measuring device directly. Mercury meter and speedometer are the examples of analogue computer.

2. **Digital Computers:** They are designed to perform logical operations and calculations at a high speed. A digital computer accepts raw data as numbers or digits and then, to produce output, it processes it with the programs stored in its memory. The modern computers like desktops and laptops fall under the category of digital computers.

Page 11 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

3. **Hybrid Computer:** It contains the features of both Digital and Analogue computers. It has accuracy and memory like digital computers and is fast like Analogue computers. It can process both discrete and continuous data and hence it is widely used in specialized applications where both digital and analogue data is processed, example being a petrol pump where a processor is used to convert the measurement of fuel flow into price and quantity.

On the basis of size, computers can be classified into four types

1. **Microcomputer:** It is also known as Personal Computer. This general-purpose computer is mainly designed for individual use. It consists of a microprocessor, which works as the Central Processing Unit, storage area, memory, and input and output unit. The most famous examples of Microcomputers are Desktop computers, Laptop computers and palmtop.

2. **Min computer:** It is a multiprocessing computer of midsize. It has the capacity of entertaining 4 to 200 users at one given time and consists of 2 or more processors. Mini computers are mostly used in departments and institutes for the tasks like inventory management, billing and accounting.

3. **Mainframe computer:** They have the capacity of supporting hundreds or thousands of users simultaneously and they can also support multiple programs at the same time. This means that different processes can be executed simultaneously by a Mainframe Computer. Hence, organizations that need to process and manage high volume of data find mainframe computers ideal for them. Telecom and banking sectors are examples of such organizations. Mainframe computers are useful for tasks related to:

- Census taking
- Industry and consumer statistics
- Enterprise resource planning
- Transaction processing
- e-business and e-commerce

4. **Super/Macro computers:** They are the fastest in speed and the biggest in size and specialize in processing a huge amount of data. A supercomputer contains thousands of interconnected processors that help it process trillions of instructions in just a second. Supercomputers are used for complex tasks, such as:

- Weather forecasting
- Climate research
- Scientific simulation
- Oil and gas exploration
- Quantum mechanics

1.1.2 Basic concept internal and external hardware components

External hardware components

External describes a hardware device that's installed outside of the computer. For example, a printer is an external device because it connects to the back of the computer and is outside the case. However, a video card is an internal device since it is found inside of the computer case.

Keyboard: It is one of the most important tools used to enter the information and numbers and different characters to the computer to address and get the results.

Mouse: It is a tool used to mark or identify certain information that appears on the computer screen, and it needs a person or an assistant to manage it correctly.

Microphone: A device that specializes in receiving sounds and inserting them into the computer in order to modify or retain them. It also contributes greatly to the various voice conversations on the computer.

Scanner: A device that helps to insert various images and graphics into a computer, converting it from its graphic nature to another digital nature.

Printer: Used to output information, data, such as numbers, letters, and images printed on paper.











Plotters: Used in the output of geometric drawings, and in various sizes, and then printed on paper.

Camera: which works to capture different images and keep them in the device.

Internal Hardware components

Internal describes a device that's installed inside the computer. For example, a video card is an internal device and a printer is an external device. When referring to a drive, an internal drive (e.g., internal hard drive) is any drive inside the computer. In the picture is an example of computer memory and an example of internal hardware. Below are additional examples of internal hardware in a computer.

Table1. 1 The most common internal Hardware

	Power Supply A power supply changes normal household electricity into electricity that a computer can use.		Hard Drive A hard drive is the primary device that a computer uses to store information
	Expansion Card An expansion card lets you add new features to a computer.		Expansion Slot An expansion slot is a socket on the motherboard that expansion cards plug into.
	Motherboard The motherboard is the main circuit board of a computer. All computer components attached to the motherboard.		Central Processing Unit (CPU) The CPU processes instructions, performs calculations and manages the flow of information through a computer.
	Random Access Memory (RAM) RAM temporarily stores information inside a computer. The Information is lost when computer is turned off.		CD-ROM A CD-ROM drive reads information stored in compact discs (CDs).
	Drive Bay A drive bay is the space inside the computer case where a hard drive, floppy drive or CD-ROM drive sits.		Floppy Drive A floppy drive stores and retrieves information on floppy disks.

1.1.3 Identifying and categorizing computer software

Software: means instructions that tell a computer what to do when to do and how to do the hardware part of the computer. Software comprises the entire set of programs, procedures, and routines associated with the operation of a computer system. There are different types of software that can run on a computer: system software, utility software, and application software.

System Software is a set of programs that control and manage the operations of computer hardware. It also helps application programs to execute correctly. System Software's are designed to control the operation and extend the processing functionalities of a computer system. System software makes the operation of a computer faster, effective, and secure. Example: Operating system, programming language, Communication software, etc.

Utility Software is system software that helps to maintain the proper and smooth functioning of a Computer System. It assists the Operating System to manage, organize, maintain, and optimize the functioning of the computer system. Utility Software performs certain tasks like virus detection, installation, and uninstallation, data backup, deletion of unwanted files, etc. Some examples are antivirus software, file management tools, compression tools, disk management tools, etc.

Application Software is a type of computer program that performs specific functions. These functions, performed by application software, can be personal, business as well as educational. Thus, application Software is also known as end-user software or productivity software. This application software includes: Microsoft products such as Office, PowerPoint, Word, Excel, Outlook, etc.

1.2 Documenting and reporting client requirements

If the peripheral is an essential part of the computer system (for example mouse, keyboard or monitor) it is logical to record information about the device within the documentation for the computer to which it is connected. Individual computer inventories will often contain detailed information about the computer's related hardware and software. It may also be more practical to record information about the peripheral inside the computer's record, if the device is also permanently connected to a computer (for example a printer or scanner).

Table1. 2 Details of computer specification for Inventories

Manufacturer:	Dell
Model:	OptiPlex GX280MT Minitower—Power
Operating System:	Windows 10
Serial number:	12345
RAM:	4GB
Hard disk space:	500 Gb
Monitor:	Dell OptiPlex 7010
Printer:	HP LaserJet d402
Keyboard:	Dell USB keyboard
Pointing device:	Dell USB 2-button optical mouse with scroll

1.2.1 Individually documenting each peripheral device

If the device is shared between several computers, it makes more sense to keep information about the peripheral as an individual entry in an inventory. Devices such as digital cameras, data projectors and USB drives would more likely to be used by many computers, thus it would make more sense to record their details separate to the computer details for recording hardware inventory information.

Hardware Inventory Sample	
Serial Number	1001
Hardware Device Description	Laser Printer
Manufacturer	Hewlett Packard
Model	Laserjet 1010
Supplier	Harris Technology
Date of Purchase	5/12/2004
Purchase Price	\$375.00
Warranty Expiry Date	5/12/2005

Figure1. 1 Sample hardware inventory

1.3 Verifying client requirements

Client hardware requirements may vary depending upon the installed base of computers at your facility. However, based on experience with multiple customer sites, we recommend the following configuration:

- Pentium 4-based computer with 2 GB of RAM (minimum)
- 80-GB hard drive space (minimum)
- DVD drive
- Network interface software for network communications supporting TCP/IP
- Monitor for the lab and floor operations, 100 percent IBM compatible, supporting a 24-bit graphics card for 1024 x 768 or higher resolution and at least 65535 colors
- Two-button mouse with scroll wheel or compatible pointing device such as a touch screen

1.4 Taking action to ensure client support expectations

1.4.1 Vendor Warranty

A warranty is an agreed upon term which covers a computer or computer component. Generally, most computers have a 1- or 3-year warranty. This warranty may or may not cover the service, repair and replacement of computer parts.

An extended warranty is an available option provided by manufacturers or third-party companies that provides additional support and/or repair of a computer or other hardware devices beyond its standard warranty.

1.4.2 Support Services

It is important to know what kind of support services are offered by the prospective supplier.

There are many questions to consider such as:

- If a device requires repairs, does it have to be sent back to the supplier (called ‘Return to base’) or will they provide on-site visits?
- What is the average response time if service is required?
- What kinds of maintenance and repair costs could be incurred during the duration of use of the device?
- Will the device require regular servicing? If so, how many services will be necessary over a one-year period?

Page 17 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

Self-check -1

Directions: Answer all the questions listed below.

Test 1 Choose the best answer for the given alternative.

- Which types of computers is used for complex tasks like forecasting weather conditioning, oil and gas exploration and quantum mechanics?
 - Microcomputer
 - Mainframe computer
 - Macro computer
 - Mini computer
- A collection of unorganized facts & figures and does not provide any further information regarding patterns, context?
 - Data
 - Information
 - Database
 - None of the above
- Among the following hardware components of a computer is one is **odd** from the others?
 - Keyboard
 - Mouse
 - scanner
 - Mother board

Test2 Matching column “A” with column “B”

Column “A”

- First Generation
- Third Generation
- Fourth Generation
- Fifth Generation
- Second Generation

Column “B”

- Vacuum tube
- Artificial inelegancy
- Transistors
- Micro processor
- Integrated circuit

Test 3 Give short answers

- Write at least three characteristics of computer
- Define clearly vendor warranty?
- List at least four external and internal hardware components each?

UNIT TWO: CREATE DOCUMENT STRUCTURE

This unit to provide you the necessary information regarding the following content coverage and topics:

- Obtaining peripherals
- Entering peripherals into equipment inventory
- Storing Peripherals according to vendor/manual guidelines

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Obtain Peripheral devices
- Enter peripherals into equipment inventory
- Store Peripherals according to vendor/manual guidelines

Page 19 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

2.1 Obtaining peripherals

The first step in obtaining a peripheral device is to locate suppliers of that device. Then, there are factors you need to consider about the supplier and the devices on offer, such as support provided and purchase price. This will help you to compare and choose the most appropriate supplier and the exact model of the device according to client requirements. Finally, you are ready to place an order for your organization or client to purchase the device.

2.1.1 Locate suppliers

There are many ways to find a supplier of peripheral equipment. Some ways include:

- Searching the Internet
- PC magazines
- Newspapers
- Brochures/advertising material
- Telephone directory
- Contacting the manufacturer directly

2.1.2 Choosing a supplier

With so many choices of suppliers available, how do you find the right one? There are a few factors to consider:

- How long has the supplier been operating?
- Does the supplier offer suitable support and training?
- Does the supplier offer competitive pricing?
- Is the supplier a preferred supplier for your organisation?

2.1.3 Selecting a peripheral

Once you have selected suitable suppliers you need to contact each supplier. Information you should find out from the supplier includes:

- price of each model
- Availability of each model.

2.1.4 Placing order

Depending on the type of organization you work for, placing an order for a hardware peripheral device could be done in a variety of ways. In a small organization you may be responsible for ordering the device yourself. However, in a larger organization there may be employees who are responsible for purchasing new equipment. You may need to fill out an order form that can be given to the purchasing department.

2.2 Entering peripherals into equipment inventory

2.2.1 Hardware inventories

The purpose of a hardware inventory (or registry) is to keep detailed information about all the hardware equipment within an organization. Every piece of hardware, including each computer and peripheral device, should be recorded on the inventory. As well as providing an excellent quick reference guide to the organization's hardware, an inventory can be very useful for insurance, warranty and service purposes.

In order for an inventory to be a valuable source of information, it is vital that the information be maintained regularly. New devices need to be entered into the inventory as soon as they have been obtained.

There are a number of tools available to create hardware inventories. Databases and spread sheets are often used to store the information. There are also software programs that you can purchase, designed specifically for recording hardware and software details. Although these programs are good for keeping a 'soft copy' of the information, it is also essential that you keep a current 'hard copy' (printed version) of the inventory. In this way, if the computer system ever fails you will still have the information.

Details that should be included within a hardware inventory includes:-

- Description of hardware device
- Manufacturer
- Supplier
- Model number
- Serial number
- Components
- Location
- Purchase price

2.3 Storing Peripherals according to vendor manual guidelines

Peripheral devices need to be located in a suitable environment; otherwise, there may be potential problems. It is a good idea to refer to the manufacturer's manual to determine what guidelines should be followed. When storing peripherals, it is important to:

- Make sure equipment is kept in ideal working conditions
- Adhere to current Occupational Health and Safety guidelines
- Ensure the electrical safety of the device
- Consider security of the device.

2.3.1 Keeping equipment in ideal work condition

Each manufacturer will have their own recommendations on how to store their peripheral equipment. In order to guarantee that a peripheral will function correctly throughout its life it is important to follow guidelines that have been recommended by the manufacturer. Some common recommendations may include:

- Keep equipment in the correct position
- Keep equipment away from weather, dust and other harmful
- Do not expose equipment to extreme temperatures and high humidity
- Avoid storing the device in direct sunlight
- Do not expose equipment to water or moisture

2.3.2 Ensuring electrical safety

Some tips to ensure electrical safety are:

- Never use damaged plugs or leads.
- If possible, ask an electrician to check the safety of your system.
- Position electrical leads where they will not cause tripping hazards to people.

2.3.3 Physical security

In many situations it is important to consider the physical security of the peripheral devices. Some devices, such as digital cameras, data projectors and USB drives, may not be permanently connected to a computer so it will be necessary to find a secure location to store the device. Make sure that these kinds of devices are secured in a lockable storage cupboard, cabinet or safe when not required. Some organizations install security devices onto desks to guarantee that computers are secure and will not be able to be taken from their position unless unlocked.

Page 22 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
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Self-check -2

Instruction: Answer all the questions listed below, if you have some clarifications- feel free to ask your teacher.

1. Explain the appropriate storage place when storing peripheral devices?
2. Explain the effect of unappropriated work place when storing peripheral devices?
3. Least ways to find a supplier of peripheral equipment?

UNIT THREE: CONNECT HARDWARE PERIPHERALS

This unit to provide you the necessary information regarding the following content coverage and topics:

- Considering environmental and OHS standard
- Removing and/or replacing old peripherals
- Configuring operating system to accept the new peripherals
- Testing and confirming hardware peripherals

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Consider environmental and OHS standard
- Remove or replace old peripherals
- Configure operating system to accept the new peripherals
- Test and confirm hardware peripherals

Page 24 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

3.1 Considering environmental and OHS standard

One of the most important considerations when installing a new hardware peripheral is to try and install the device with the least amount of timeframe for installation, environmental consideration and OH&S standards. A client may not be very happy if you install a piece of hardware equipment while they are creating an urgent report, if may take time to install it the peripheral devices and also the interconnection of the devices creates un-proper/un-safe/ working condition at the work place within any organization. It is important to schedule installation time and OHS standards that are: -

- Also suitable to the client's or computer user's
- Sufficient length to install and thoroughly test the hardware device and
- Create attractive working place for the clients

To achieve this, make sure that you are aware of: -

- Common organizational procedures/guideline/ that regularly need to be performed on the computer (for example, end of month processing or weekly backups) and plan installations outside these periods and the way to create save work place.
- Current working condition, deadlines and schedules of the client/user. Therefore, the installations and the OHS standards should be scheduled for the times such as:
- Quiet periods (for example, during holiday periods)
- Before or after normal office hours
- While the client/user is out of the office
- When the client will not need their computer.

3.1.1 Environmental Consideration

It can be difficult to work out how long it will take to install a peripheral device. It will vary according to the type of device, current environmental consideration, problems requiring troubleshooting and the experience of the installer/technicians/. If you will be regularly performing installations, keeping a log of installations, nothing that create disruption to the users are required and problems experienced, could help to estimate the time spent on future installations and create safely work place at any organization.

Page 25 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

Once you have arranged a suitable time, make sure you adhere to it or give advanced notice if you will be delayed. Remember that clients may have scheduled their daily workload around the installation.

Also consider the timeframe expected by client when installing new hardware peripherals. If you work for a busy organization, it may be necessary to work out a daily to-do list. Order tasks with priority given to installations that perform critical functions or have been waiting to be done for the longest amount of time for installation.

3.2 Removing and/or replacing old peripherals

All computer users important to understand safely connect hardware peripherals devices according to vendor instructions with a minimum of down time to the system and ensure that you adhere to the OH&S regulations relating to working with electrical equipment's as well as environmental consideration like dust, temperature, humidity, electric system, working tables and so on.

- **Connecting Peripherals**
 - ✓ Connect the hardware
 - ✓ Install the software drivers
 - ✓ Test the peripheral
- **Peripheral Software Drivers**
 - ✓ Driver software: allows computer to recognize new hardware
 - ✓ windows have it for common hardware e.g., modem
 - ✓ if comes with 'disk' use it as it is more recent
 - ✓ if on internet check 'readme.txt' file first – latest drivers
 - ✓ peripheral manual guides to installation process OR 'control panel'
- **Installing the Drivers for Peripheral Configurations**

Drivers for monitors on windows drivers otherwise you wouldn't be able to see. But if specific, install by: -

- ✓ **Plug and Play**

Computer will recognize new device when turned on and connected → on-screen wizard – choose between automatic/manual installation.

- ✓ **Automatic detection**

If monitor not plug and play compatible → **Control panel**

Page 26 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
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Double click on ‘install new hardware.

✓ **Manual Detection**

If select ‘no’ to automatic detection, you will be asked to choose type of device, If have a software driver click ‘have disk’ , Installation will proceed, then **backup** any system files changed during installation ‘readme.txt/ file contains.

3.3 Configuring operating system to accept the new peripherals

With the large variety of computer systems, operating systems, peripheral device types and features, and manufacturers, each peripheral device will have its own individual installation procedures. It is important to refer to manufacturer guidelines and manuals when installing any hardware device to ensure that all procedures are correctly followed. Procedures which are generally followed when installing any new peripheral device include:

- Plugging in the cables between the device and computer system
- Installing driver software for configuration
- Troubleshooting device installation when necessary
- Customising the device and updating drivers
- Testing the device for satisfying required conditions of clients

Whenever you install a hardware peripheral device, you may also have to install a driver depending on types of devices. A device driver is a software program that allows the hardware device to talk to the operating system and create an interface between users and devices.

Generally, device driver software will be included within the packaging of a new device. Sometimes operating systems, such as Windows XP, Windows 7, automatically provide their own drivers if you don’t provide one. At times it may be necessary to find a newer version of a driver than the one that has been provided by the manufacturer. It is a good idea to regularly check the manufacturer’s website to see if any new drivers have been developed for the specific peripheral devices.

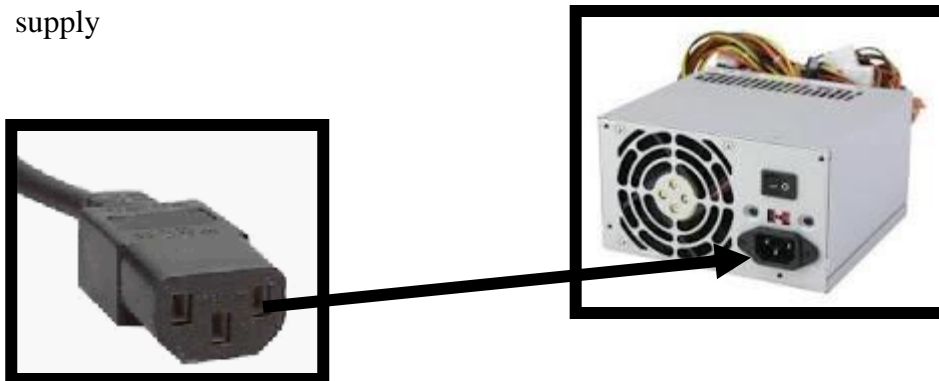
Plug and play is a hardware technology that enables many operating systems to automatically recognize new hardware devices and configure them automatically. Most USB devices support plug and play (PnP devices).

Page 27 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

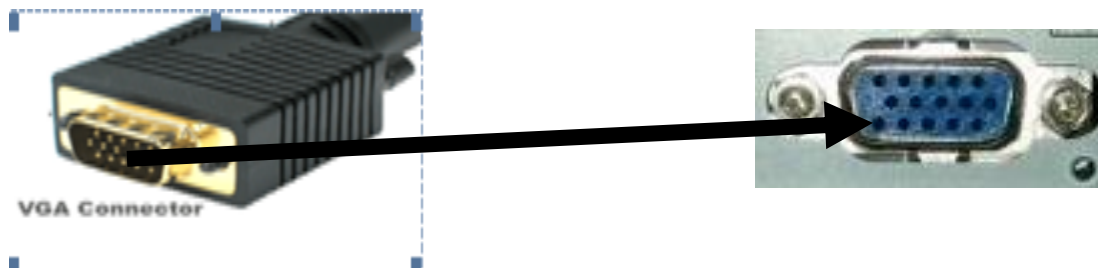
- **Plugging in the cables between the device and computer system**

To make your computer work, you need to connect all the hardware peripherals to the ports at the back of the system unit case. Before connecting all the peripherals to its corresponding ports, check it that the power cord was unplug into the power source to prevent electrical related injury. You should be able to connect the Mouse, Keyboard, Monitor, Printer, Scanner, Speaker and power up your computer by connecting the power cord to the power supply. After doing so, you can now start using your computer. Some examples as follows:-

- Before powering up your Pc, make sure that the power cable was connected to the power supply



- Connect the monitor by using the VGA cord connector to the port



Monitors will either have a VGA or a newer DVI plug (see picture, as they are a lot less apparent than PS/2 / USB by comparison). Most monitors use VGA connectors, and so most graphics cards have VGA output. If you have one type of plug and the graphics card has another, you can easily buy an adapter. Some cards even come with one.

- **Connecting Mouse and Keyboard**

There are two standard connectors for mice and keyboards; PS/2 connectors and the more modern USB connectors. Plug the mouse and keyboard in the appropriate slot.



PS2 Cable



- To connect the scanner to the PC, you will use also use the USB cable.



USB Cable



- To connect the Printer to the PC, you will use the cable below via printer port. A USB cable is now also being use to connect the new printer to the computer especially the colored and laser printer.
- Steps to installing and configuring a printer

Printer cable



Step1. Obtain the correct printer cable

Page 29 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

In many cases a printer won't automatically have a cable included with the original purchase. Check the printer specifications; you will probably need to buy either a parallel or USB cable.

Step2. Plug in the cable

- Turn off the power of both printer and computer system
- Plug the printer cable into the correct port of the computer but depending on the type of printer the port will most likely to be either a USB or a parallel port located on the back of the computer system. If you are plugging the cable into a parallel port connection you will need to secure the cable by either tightening small screws or snapping in wire connectors.

Steps3. Install ink cartridges of printers

Depending on the printer you have you may need to install an ink cartridge (for inkjet printers) or toner cartridge (for laser printers). Turn the computer's power on and follow the manufacturer's guidelines to install a new cartridge.

Steps4. Install the printer driver

At some point the computer will either recognise that new hardware has been installed (for example if the operating system is plug and play compatible) or you will need to tell the computer that a new device has been added. In other case, you will work at some stage be asked for the printer model and a printer driver. Make sure you install the printer driver at this stage. Sometimes the installation CD will automatically run, installing the printer driver at the same time.

Steps5. Print a test page

Often at the end of the driver installation you will be asked if you would like to print a test page. This is a good idea because you can quickly determine if the printer is working correctly. If not you can troubleshoot the installation.

Customizing the printer

Depending on your client's needs, there may be a need to alter the default printer settings. Some settings that may be customised include:

- Changing the page layout: - a page may need to be printed in either landscape or portrait orientation.
- Changing the paper source/size/-: depending on the complexity of the printer there may be a variety of trays the printer has available to use.

Page 30 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

- Changing the print quality: - depending on the printer use, a client may require best, normal or draft quality of print.
- Setting the default printer: - if there is more than one printer attached to a computer, you may need to change the settings so that the newer model is considered the default model.

3.4 Testing and confirming hardware peripherals

In addition to ensuring a device is able to perform a basic task (such as printing a test page or scanning an image) it is also necessary that all functionality required by the client is tested. When new peripheral equipment is not tested for critical functions before being used, it can lead to malfunction, causing large disruptions to clients and potentially damage other parts of a computer system.

Ensure that all new installations are thoroughly tested after initial setup and prior to use by the client. Printers need to be routinely tested, as components such as the ink cartridges and toner can cause deterioration of print quality and may require maintenance and/or cleaning.

All tests should be completed according to a documented test plan.

Some suggestions of functions that may be tested for a printer, scanner and digital camera devices are included as follows: -

Printer: - Printer functions that may be tested are: -

- Can the printer handle different paper types?
- Will the printer work successfully on different computers?
- Will the printer work successfully with different software packages (for example, word processing, spread sheets and desktop publishing)?
- Is black and white print quality acceptable to clients?
- Is colour print quality acceptable to clients?

3.4.1 Test plan

A test plan is used to work out a structured process to ensure that a new device will work under all expected circumstances. It logically describes: -

- Functions that need to be tested
- An example test case scenario
- Expected results for each scenario

Page 31 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

Self-Check -3

Directions: Answer all the questions listed below.

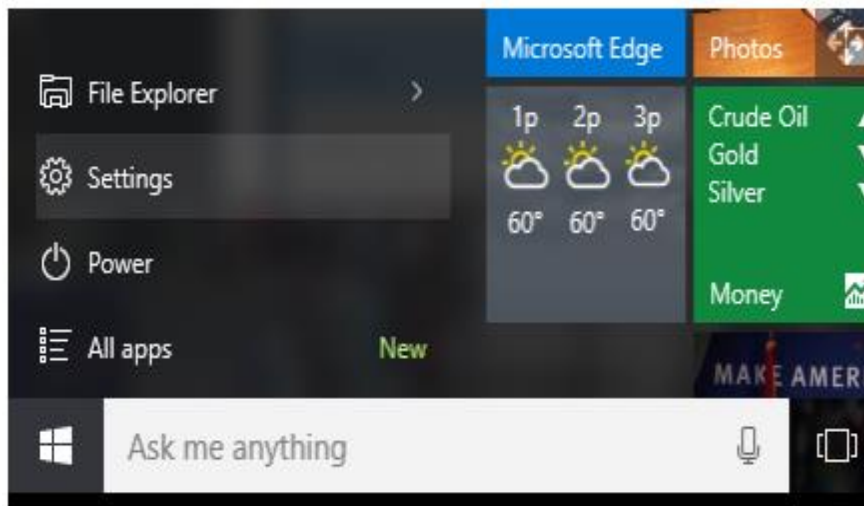
1. Explain the difference between installing and configuring peripheral devices?
2. What must be done after the installation of hardware peripherals?
3. Advantages of applying OHS at work place when installing peripheral devices?

Operation Sheet 3.1 adding local printer

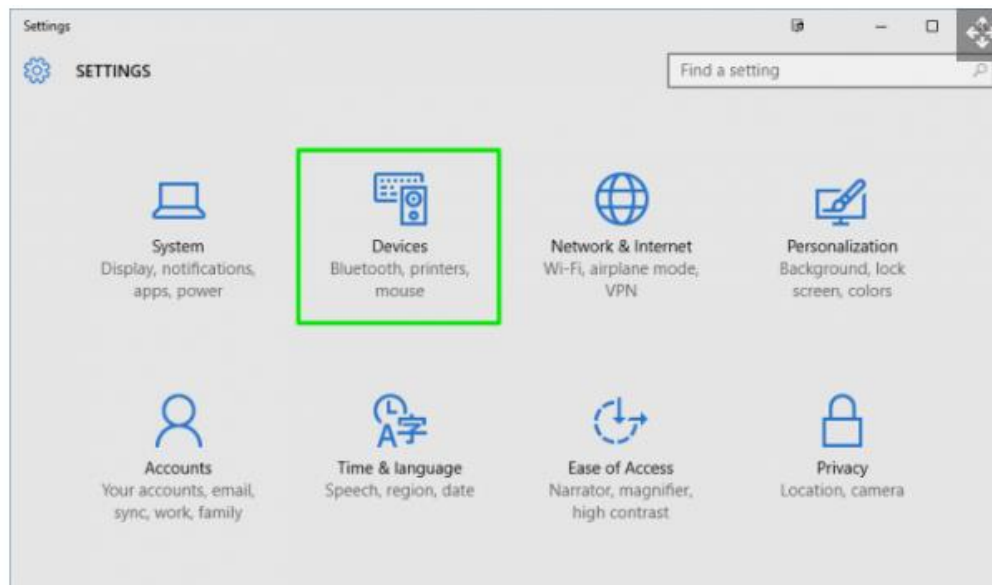
- **Operation title:** Add a local printer
- **Purpose:** To connect printer and computer for printed documents.
- **Instruction:** Use the given step below appropriately. For this operation you have given 30 minutes and you are expected to provide the answer.
- **Tools and requirement:**
 - ✓ Computer
 - ✓ Printer
 - ✓ Divider
 - ✓ Paper
 - ✓ Printer data cable or crimped network cable
- **Precautions:** before starting computer identify and plunge the correct peripheral and check printers to get power.
- **Procedures**

Step 1: - Connect the printer to your computer using the USB cable and turn it on.

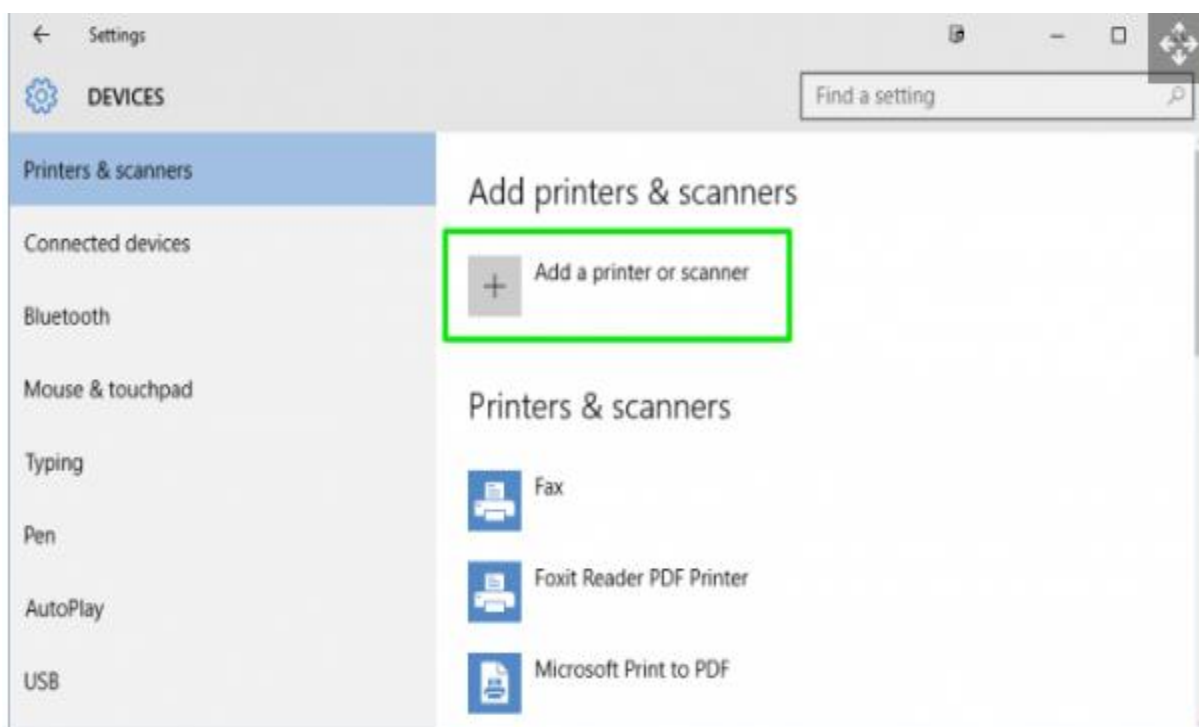
Step 2: - Open the Settings app from the Start menu.



Step 3: - Click Devices.



Step 4: - Click Add a printer or scanner.



Step 5: - If Windows detects your printer, click on the name of the printer and follow the on-screen instructions to finish the installation. And you're done.

Page 34 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

If Windows doesn't find your connected printer, click on "The printer that I want isn't listed" link.

Add printers & scanners



Refresh

[The printer that I want isn't listed](#)

- **Quality Criteria:** final print test pages and print any documents as you went.

Page 35 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

Lap Test 3

Task 1: install printer driver to communicate with computer and print test page?

Task 2: Print any document as you want?

Task 3: Remove and replace old internal and external hardware peripherals based on organizational policy?

Page 36 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

UNIT FOUR: CONNECT A WORKSTATION TO THE INTERNET

This unit to provide you the necessary information regarding the following content coverage and topics:

- ISP and telecom service organizations
- ISP technologies and services they offer
- Connecting workstations to the internet
- internet browser software

This guide will also assist you to attain the learning outcomes stated in the cover page.

Specifically, upon completion of this learning guide, you will be able to:

- Select and create communication with ISP and telecom service organizations
- Understand ISP technologies and services they offer
- Connecting workstations to the internet
- Launching internet browser software

4.1 Communication with ISP and telecom service organizations

An ISP (internet service provider) is a company that provides individuals and organizations access to the internet and other related services. An ISP has the equipment and the telecommunication line access required to have a point of presence on the internet for the geographic area served. The most important factors to consider when selecting an internet service provider are availability, speed, price, and internet connection type. Internet service providers connect your personal or business computer, laptop, mobile device etc. to the internet. ISPs may be commercial, non-profit, privately owned or community owned companies. Most providers offer the same types of internet services to customers, including:

- internet access
- email access
- domain name registration
- web hosting
- co-location (or data center services)

4.2 Selecting the right type of internet service provider

When selecting an ISP, you should carefully determine your ISP requirements. You should consider:

- the type of services you need
- the costs and quality of services
- the number of users needing an internet connection
- the location of the users
- the bandwidth capacity
- contention ratios and other terms and conditions of the service

You should also determine if, either now or in the future, you might need:

- Virtual Private Network (VPN) access
- email access
- website hosting services
- domain registration
- e-commerce facilities
- access to [cloud technologies](#)

Page 38 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

4.3 Connecting workstations to the internet

To connecting computers to the internet connection for accessing information over a network either by using connection based or connectionless internet infrastructure the user must be connected to the internet access through internet service providers (ISP). There are three types of connection such as: -

4.3.1 Dialup connection

Dial-up internet access is a form of Internet access that uses the facilities of the public switched telephone network (PSTN) to establish a dialed connection to an Internet service provider (ISP) via telephone lines. Allows you to connect to the internet via a local server using a standard 56k modem

Advantages of dial up internet connection

- Very economic and widely available
- Hardware cost are minimal since it uses a standard modem
- Easy configuration
- Convenient for one computer or small network

Disadvantages of dial up internet connection

- The slowest connection
- Since it uses a 56k modem, it transfers 56 kilobits a second (7 KB) of data
- The average webpage size is about 50Kbyte
- So, it takes 7 seconds to load a webpage
- Your telephone line will be busy when connected

4.3.2 Leased connection

A leased line is a dedicated data connection with a fixed bandwidth. It enables small, medium, and large businesses to connect to the internet in a secure, reliable, and highly efficient manner, with maximum download capacity, resilience, and uptime.

Leased internet connection can be found in many forms the popular two are: -

1. **ADSL** (Asymmetric Digital Subscriber Line or DSL for short) is a high-speed Internet access service that utilizes existing copper telephones lines to send and receive data at speeds that far exceed conventional dial-up modems. The fastest dial-up modems are rated at 57 kilobits per second (Kbps), and usually operate at about 53 Kbps under good conditions. By comparison,

Page 39 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
---------------	--	------------------------------------	-------------------------------

ADSL allows data stream speeds from 1.5 to 8 megabits per second (Mbps), depending on the grade of ADSL service purchased.

ADSL uses standard telephone lines to transmit upstream and downstream data on a digital frequency, which sets these data streams apart from the analog signals telephones and fax machines use.

Asymmetric DSL (ADSL) is currently the most commonly used DSL technology.

- Has a fast downstream speed, typically 1.5 Mbps.
- Upload rate of ADSL is slower.
- Not the best solution for hosting a web server or FTP server

DSL Types

Table 4 1 types of ADSL and Description

No.	Type	Description
1	ADSL	Asymmetric DSL is most common. Downstream speed from 384 Kbps to 6 Mbps. Upstream speeds lower than downstream speeds
2	HDSL	High Data Rate DSL provides equal bandwidth in both directions.
3	SDSL	Symmetric DSL provides the same speed, up to 3 Mbps, for uploads and downloads
4	VDSL	Very High Data Rate DSL is capable of bandwidths between 13 and 52 Mbps downstream, and 16 Mbps upstream
5	ISDL	ISDN DSL is DSL over ISDN lines. Uses ordinary phone lines. Requires ISDN adapters

Advantage of ADSL

- Always on
- Transfer data and voice at the same time
- Fast

Disadvantages of ADSL

- Does not available everywhere
- Additional hardware cost, since it needs a special modem called ADSL modem

4.3.3 Cable Connection

In telecommunications, cable Internet access, often called simply cable Internet, is a form of broadband Internet access that uses the cable television infrastructure. Like digital subscriber line, cable Internet access provides network edge connectivity (last mile access) from the Internet service provider to an end user. It is integrated into the cable television infrastructure analogously to DSL which uses the existing telephone network.

Cable connection has the following characteristics

- It uses a separate cable than phone line to transfer data
- Very fast and reliable
- Fixed monthly fee

Advantage of cable connection

- Very fast
- Always on
- Doesn't affect to make/receive a phone call, since it uses a separate cable

Disadvantages of cable connection

- Doesn't available everywhere
- It needs a special modem called cable modem

4.3.4 Wireless connection (Wi-Fi network Connection)

Wireless is a term used to define telecommunication and data transmission without wires. In a broad sense, wireless refers to any telecommunications or data transfer in which electromagnetic waves -- rather than some form of wire or cable -- carry signals over all or part of the data communication path.

Page 41 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1
			September, 2022

A WLAN, or wireless LAN, is a network that allows devices to connect and communicate wirelessly. Unlike a traditional wired LAN, in which devices communicate over Ethernet cables, devices on a WLAN communicate via Wi-Fi.



Figure4. 1 WLAN diagram with connected devices

4.4 Launching internet browser software

Now a time there are so many different types of internet browsers that used to access different information on the internet. From time to time all users to access information from the internet, any client installs and updating the internet browsers that to be uses. But all users/clients make sure that the modem is switched on and connected to a live internet line connection and make sure your connection software is configured properly.

Choose your web browser

- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Internet Explorer Safari



Chrome



Safari



Firefox



Edge



Opera



Internet Explorer

Self-check -4

Directions: Answer all the questions listed below.

Test 1 choose the best answer for the given alternative.

1. Which one of the following is the advantages of Advantage of ADSL
 - A. Always on
 - B. Transfer data and voice at the same time
 - C. Fast
 - D. All of the above
2. What are the requirements you should carefully selecting an ISP?
 - A. the location of the users
 - B. the type of services you need
 - C. the costs and quality of services
 - D. the bandwidth capacity
 - E. all of the above

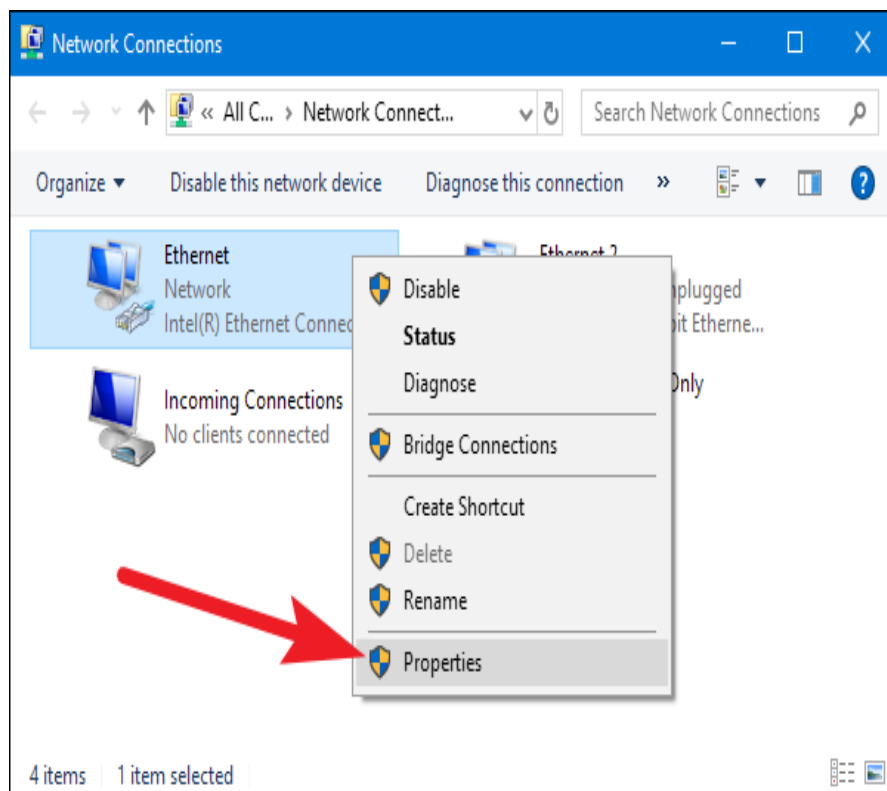
Test 2 filling the blank space

1. _____ used to define telecommunication and data transmission without wires.
2. ADSL stand for _____
3. Write at least two Advantage of cable connection?
4. List at least four types of ADSL?

Operation Sheet 4.1 configuring internet to use internet

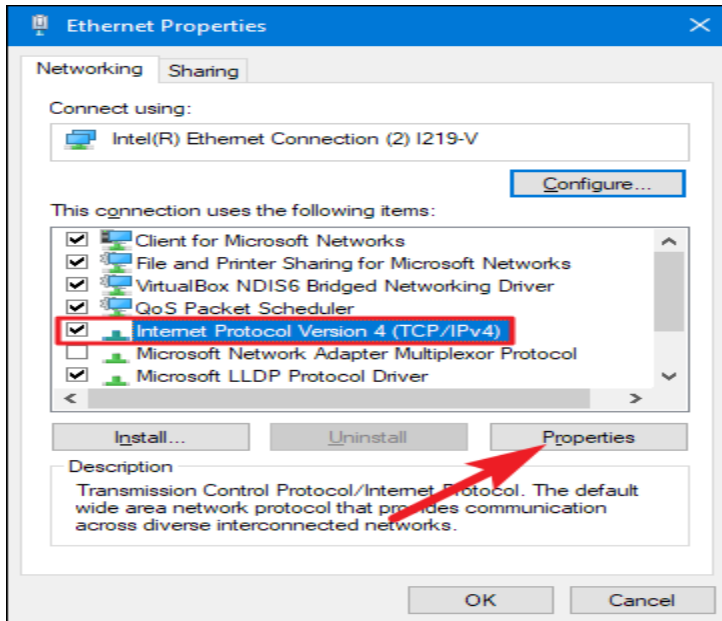
- **Operation title:** configure internet
- **Purpose:** statically assign IP address to computer used searching information from internet correctly.
- **Instruction:** Use the given step below appropriately. For this operation you have given 15 minutes and you are expected to provide the answer.
- **Tools and requirement:**
 1. Computer
 2. Divider
 3. Computer power cable
- **Precautions:** before starting computer identify and plunge the correct peripheral
- **Procedures in doing the task**

Step 1: - In the “Network Connections” window, right-click the adapter for which you want to set a static IP address, and then select the “Properties” command.

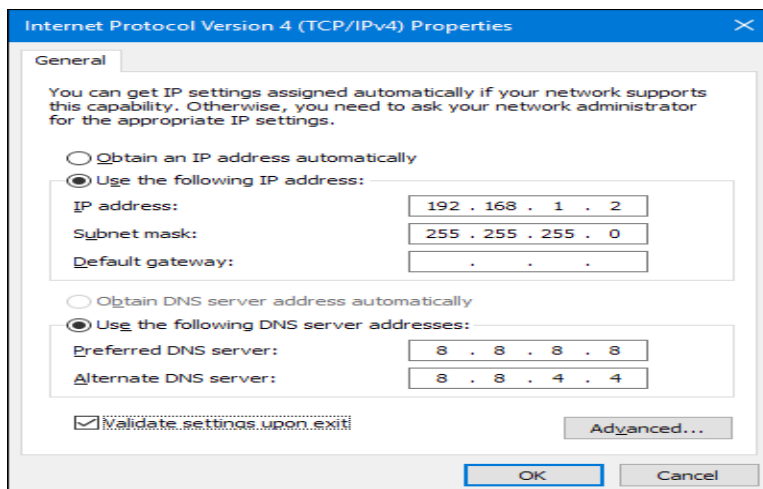


Page 44 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
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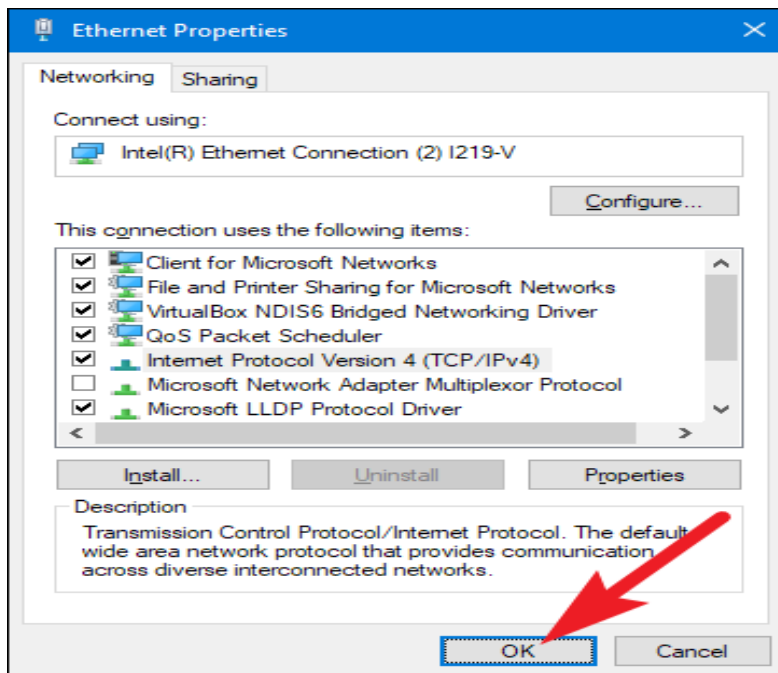
Step 2:- In the properties window for the adapter, select “Internet Protocol Version 4 (TCP/IPv4)” and then click the “Properties” button.



Step 3: - Select the “Use the following IP address” option, and then type in the IP address, subnet mask, and default gateway that corresponds with your network setup. Next type in your preferred and alternate DNS server addresses. Finally, select the “Validate settings upon exit” option so that Windows immediately checks your new IP address and corresponding information to ensure that it works and then click the “OK” button.



Step 4:- close out of the network adapter's properties window.



- **Quality criteria:** Correctly plunge peripheral device, start the computer and switch off computer

Lap Test #4

- Task1: Create dial up connection appropriately?
- Task2: Assigning statically TCP\IP Address?

Reference

- <https://codescracker.com/computer-fundamental/characteristics-of-computer.htm>
- Winn L Rosch. The Winn L. Rosch Hardware Bible (6th Edition).
- Christopher A. Crayton Joel Z. Rosenthal Kevin J. Irwin. The A+ Certification & PC Repair Handbook (Networking Series).
- Richard Palmer. Maintenance Planning and Scheduling Handbook, 2nd Edition (McGraw-Hill Handbooks).

Page 48 of 49	Ministry of Labor and Skills Author/Copyright	Connecting hardware peripherals	Version -1 September, 2022
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