**Module 1**

What is program?

Lab exr.= The Hello World program is the first step in learning a programming language and one of the easiest programs to learn. It just prints a "Hello World" message to the screen. Now let's look at the programs in most languages:

Theory exr.= A set of instructions that a computer follows in order to perform a particular task. Functions has to perform action or related action.

WHAT IS PROGRAMING?

THEORY EXR.= The key steps in the programming process include analyzing the problem, designing the solution, writing the code, testing and debugging, and documenting the program. These steps ensure a well-structured and functional program is created.

Types of Programming Languages

LAB EXR.= High-level languages are human-friendly and abstract, making them easier to learn and use, while low-level languages are closer to the machine and require detailed knowledge of the computer's architecture.

World Wide Web & How Internet Works

LAB EXER= a client is a device or software that requests resources or services from a server, which provides those resources or services.

SERVER--------------INTERNENT-----------CLIENTS [MOBILE, COMPUTER, TV,]

THEORY EXER .= Client-server networks are computer networks that employ a dedicated computer to store data, manage/provide resources, and control user access (server). A web server takes a client request and gives a response back to the client. A web client enables user to request a resource kept over any web server

Network Layers on Client and Server

LAB EXER= request

←−−−−−−−− [TV]

SERVER--------------INTERNET--------[LEPTOP]

response

−−−−−−−−→ [ PC]

Theory exer= The TCP/IP model, also known as the Internet protocol suite, is a conceptual framework that standardizes how data is transmitted over networks. It divides the communication process into four layers: Application, Transport, Internet, and Network Access.

Client and Servers.

THEORY EXER= Client-server communication is a model where a client (e.g., browser, mobile app) requests services from a server (e.g., web server, database), which processes the request and responds over a network using protocols like HTTP, WebSockets, or gRPC.

Types of Internet Connections

LAB EXER= Different types of internet connections include broadband, fiber, DSL, cable, satellite, and wireless options like 4G/5G. Broadband is a general term for high-speed internet, while fiber uses light signals for extremely fast and reliable connections. DSL relies on phone lines, cable uses coaxial cables, and satellite beams data from space. Wireless options, such as 4G/5G, utilize cellular networks for internet access.

THEORY EXER= Broadband is a general term for any high-speed internet connection, while fiber-optic internet is a specific type of broadband that uses fiber optic cables to transmit data.

Protocols

LAB THEORY

* FTP-- FTP stands for File transfer protocol.
* FTP is a standard internet protocol provided by TCP/IP used for transmitting files from one host to another.
* It is mainly used for transferring web page files from their creator to the COMPUTER that acts as a server for other computer on the internet.
* It is also used for downloading files to computers from other servers.

**HTTP:**

* + HTTP stands for **Hypertext Transfer Protocol**.
  + It is a protocol used to access the data on the World Wide Web (www).
  + The HTTP protocol can be used to transfer the data in the form of plain text, hypertext, audio, video, and so on.

THEORY EXER

The main difference between HTTP and HTTPS is that HTTPS provides encryption to secure data transmission, while HTTP does not

In essence, HTTPS provides a secure layer on top of HTTP, making it the preferred protocol for websites dealing with sensitive information.

Student Account in Github

THEORY EXER.

Using GitHub for your school projects is a practical way to collaborate with others and build a portfolio that showcases real-world experience. Everyone with a GitHub account can collaborate in unlimited public and private repositories with GitHub Free.

Application Software

THEORY EXER

Application software plays a crucial role in modern businesses by enabling efficient task management, enhancing productivity, and streamlining operations

Maintenance

THEORY EXER.

A real-world case where a software application was required is a Payroll Management System. This system streamlines the process of calculating employee salaries, deductions, and taxes, and generating paychecks, which can be incredibly complex and time-consuming to manage manually, especially for larger organizations.

Software Testing

Software testing is crucial because it ensures software reliability, identifies and fixes bugs early, enhances quality, and builds user trust.

Maintenance

THEORY EXER.

Software maintenance can be broadly categorized into four types: corrective, adaptive, perfective, and preventive.

Development

THEORY EXER.

Web and desktop applications differ primarily in how they are accessed and deployed, their reliance on internet connectivity, and their performance characteristics.

27. Web Application

THEORY EXER.

Web applications offer several advantages over desktop applications, primarily due to their accessibility, ease of maintenance, and cost-effectiveness.

29. Mobile Application

THEORY EXER

Native mobile apps are built specifically for one operating system (like iOS or Android) using its native programming language (like Swift for iOS or Java/Kotlin for Android), offering optimal performance and access to device features. Hybrid apps, on the other hand, are built with web technologies (HTML, CSS, JavaScript) and wrapped in a native container, allowing them to run on multiple platforms.

31. Desktop Application

THEORY EXER.

Desktop applications, while offering advantages like performance and offline functionality, also have drawbacks such as platform dependency and update management.

32. Flow Chart

THEORY EXER.

Flowcharts are valuable tools in programming and system design because they offer a visual representation of a process, making it easier to understand, analyze, and debug code or system workflows.