

module 1

Overview of IT Industry



Q.1 What is program ?

**Ans. A program is a set of instructions that tells a computer how to perfom a task.**

Q.2 Explain in your own words what a program is and how it functions.

Ans. A program is instruction for a computer to execute specific tasks.it contains code written in a programming language which may be interpreted, compiled or assembled into machine readable form and then executed.

Q.3 what is programming?

Ans. Programming is the process of writing instructions for a computer to follow in order to solve problems.

Q.4 types of programming languages

Ans. Basically two types of programming languages:

1.high level programming language

2.low level programming language

Q.5 What are the main differences between high-level and low-level programming languages?

Ans.

- High level programming languages are easier for humans to read and understand

- low level programming languages are close to machine code.

Q.6 Describe the roles of the client and server in web communication.

Ans. Client is the device or software that initiates a request for information or services from a server which is the computer that processes the request and sends back the requested data.

Q.7 Explain the function of the TCP/IP model and its layers. Client and Servers

Ans. TCP/IP allows computers on the same network to identify and communicate with each other. TCP/IP is a two-layer protocol, with the transport layer (TCP) responsible for reliable end-to-end communication and the Internet layer (IP) accountable for routing packets from the host to the host.

Q.8 Explain Client Server Communication Types of Internet Connections

Ans. A client server is a type of network topology in which on or more computers provide a servers to the other computers.

workstation

Smartphone

**server**

Laptop

Q.9 How does broadband differ from fiber-optic internet? Protocols.

Ans. fiber-optic internet is a specific type of broadband that uses glass fibers to transmit data as light signals

Q.10 What are the differences between HTTP and HTTPS protocols?

Ans.

|  |  |  |
| --- | --- | --- |
| TITLE | HTTP | HTTPS |
| URL | URL BEGINS WITH https:// | URL begins with https:// |
| Security | Less security | More secure |
| Port | Transmit data over port 40 | Transmit data over port 443 |
| Operating layers | http operates on the application layer | https operates on the transport layer |
| SSL certificate | SSL certificate not used fir communication | User SSL certificate for communication |

Q.11 What is the role of encryption in securing applications?

Ans. Encryption plays a crucial role in securing applications by transforming sensitive data into an unreadable format, ensuring that even if an attacker gains access to the data, they cannot decipher it without the proper decryption key, effectively protecting confidential information like login credentials, financial details, and personal data from unauthorized access in transit or at rest within the application.

Software Applications and Its Types:

1.word processing software

2.spreadsheet software

3.presentation software

4.multimedia software

5.web browser

6.education software

7.graphics software

Q.12 What is the difference between system software and application software? Software Architecture

Ans.

|  |  |
| --- | --- |
| System software | Application software |
| Manage computer resources and operations. | Performs specific tasks for end-users |
| Includes operating systems and utility programs. | Includes word processors, spreadsheets,  Databases ,etc. |
| Provides an environment for application software to run. | Runs on top of system software. |
| Example : windows, Linux, macOS , antivirus software | Example : Microsoft office, web browsers , media players |

Q.13 What is the significance of modularity in software architecture?

Ans. Modularity is a software design principle that breaks code into smaller, reusable sections called modules. This improves design, development, testing, and maintenance.

Layers in software architectures:

* [Layered Architecture (N-Tier Architecture)](https://www.geeksforgeeks.org/design-patterns-architecture/#layered-architecture-ntier-architecture)
* [Microservices Architecture](https://www.geeksforgeeks.org/design-patterns-architecture/#microservices-architecture)
* [Service-Oriented Architecture (SOA)](https://www.geeksforgeeks.org/design-patterns-architecture/#serviceoriented-architecture-soa)
* [Event-Driven Architecture (EDA)](https://www.geeksforgeeks.org/design-patterns-architecture/#eventdriven-architecture-eda)
* [Hexagonal Architecture (Ports and Adapters)](https://www.geeksforgeeks.org/design-patterns-architecture/#hexagonal-architecture-ports-and-adapters)
* [Component-Based Architecture](https://www.geeksforgeeks.org/design-patterns-architecture/#componentbased-architecture)
* [Blackboard Architecture](https://www.geeksforgeeks.org/design-patterns-architecture/#blackboard-architecture)
* [CQRS (Command Query Responsibility Segregation)](https://www.geeksforgeeks.org/design-patterns-architecture/#cqrs-command-query-responsibility-segregation)
* [Serverless architecture](https://www.geeksforgeeks.org/design-patterns-architecture/#serverless-architecture)
* [Circuit Breaker Pattern](https://www.geeksforgeeks.org/design-patterns-architecture/#10-circuit-breaker-pattern)
* [Model-view-controller pattern](https://www.geeksforgeeks.org/design-patterns-architecture/#11-modelviewcontroller-pattern)

Q.14 Why are layers important in software architecture?

Ans. Layers are crucial in software architecture because they promote modularity, separation of concerns, and independent maintainability by dividing an application into distinct functional units, allowing developers to focus on specific tasks within each layer, making the code easier to manage, test, and scale as needed; essentially, each layer has a clear responsibility and can be modified without significantly impacting other parts of the system.

Q.15 : Explain the importance of a development environment in software production.

Ans. development environment is helps ensure the quality of the software, and it makes the software development process more efficient.

Q.16 What is the difference between source code and machine code?

Ans. The main difference between source code and machine code is that the source code is the programming of non-executable but standardized language code that is converted. In contrast, the machine code is the actual executable code.

Q.17 Why is version control important in software development?

Ans. Version control is important in software development because it helps teams collaborate, maintain code quality, and reduce errors.

Q.18 What are the benefits of using Github for students?

Ans. GitHub can be beneficial for students because it offers resources to learn and collaborate on projects.

Q.19 What are the differences between open-source and proprietary software?

Ans.

|  |  |  |
| --- | --- | --- |
| **Title** | **Open-source** | **Proprietary software** |
| **Access** | **Full access to source code** | **Restricted access** |
| **Cost** | **Free or low-cost** | **License fees or subscriptions** |
| **Customization** | **High customization** | **Limited customization** |
| **Support** | **Community/third party** | **The vendor** |
| **Security** | **Transparent** | **Vendor-managed updates** |
| **Time to market** | **Longer** | **Faster** |
| **Vendor lock-in** | **No vendor lock-in** | **Dependent on vendor** |
| **Integration** | **Flexible** | **Limited** |
| **Longevity** | **Long-term availability** | **Vendor-dependent lifecycle** |
| **Learning curve** | **Steeper** | **easier** |

Q.20 How does GIT improve collaboration in a software development team?

Ans. Git improves collaboration in a software development team by allowing multiple developers to work on different parts of a project simultaneously using its branching system, which enables them to make changes without interfering with each other's work, and then seamlessly merge their code back into the main project when ready, fostering a more efficient and organized workflow.

Q.21 What is the role of application software in businesses?

Ans. Application software plays a crucial role in businesses by automating tasks, managing data, facilitating communication, and supporting various business operations like accounting, sales, marketing, and human resources, ultimately improving efficiency, productivity, and decision-making capabilities within an organization.

Q.22 : What are the main stages of the software development process?

Ans.

1. Requirement gathering
2. Analysis
3. Design
4. Implementation
5. Testing
6. Maintenance

Q.23 Why is the requirement analysis phase critical in software development?

Ans. The requirement analysis phase is critical in software development because it ensures the development team fully understands the needs and expectations of stakeholders

Q.24 : What is the role of software analysis in the development process?

Ans. Software analysis plays a crucial role in the development process by thoroughly examining and documenting the requirements of a software system, ensuring that the final product meets the needs of stakeholders by identifying potential issues early on, and providing a solid foundation for design and development phases by clearly defining functionalities and system behavior.

Q.25 What are the key elements of system design?

Ans. The key elements of the design process include understanding the problem or need, brainstorming and generating ideas, creating prototypes or models, testing and refining the design, and finally implementing the design.

Q.26 : Why is software testing important?

Ans. Software testing is important because it helps ensure that software is high quality, secure, and performs as expected

Q.27 : What types of software maintenance are there?

Ans.

1. **Corrective maintenance**
2. **Adaptive maintenance**
3. **Perfective maintenance**:
4. **Preventive maintenance**

Q.28 What are the key differences between web and desktop applications?

Ans.

|  |  |
| --- | --- |
| Desktop | Web |
| App runs locally | App run in the cloud |
| Offline access | Internet access required |
| Security | Cyberattack risks |
| Manual updates | Automated updates |
| High speed | Speed depends on a lot of factors |
| Installation required | Cross platform access |

Q.29 What role does UI/UX design play in application development?

Ans. UX designers play a crucial role in mobile app development. With key skills in UX design, they collaborate with developers and stakeholders to ensure a user-centric approach.

Q.30 What are the differences between native and hybrid mobile apps?

Ans. Native apps are built for a specific operating system, while hybrid apps are built to work across multiple operating systems

Q.31 What is the significance of DFDs in system analysis?

Ans. DFDs provide a clear graphical representation of a system's processes, data flows, data stores, and external entities

Q.32 : What are the pros and cons of desktop applications compared to web applications?

Ans.

|  |  |  |
| --- | --- | --- |
| Aspect | Web application | Desktop application |
| Deployment | Accessed via web browsers | Installed on local computers |
| Platform combability | Compatible with various devices and operating systems | Typically designed for specific operating system |
| Internet connection | Requires internet connection | Can operate offline |
| Update | Update applied centrally | Updates need to be manually installed by users |
| Development technology | Typically uses web technologies(html, css, js) | Utilizes programming languages(java,c#) |
| Storage | Data stored on remote servers | Data stored locally or on server |

Q.33 How do flowcharts help in programming and system design?

Ans. Flow charts help programmers develop the most efficient coding because they can clearly see where the data is going to end up