# Module 1-Overview of IT Industry

Que-1: Explain in your own words what a program is and how it functions

Ans: A program is a set of instruction written in low level language which computer can understand to perform some specific tasks.

• Calculations.

• Web designing.

• Data processing.

Que-2: What are the key steps involved in the programming process?

Ans: The key steps involved in the programming process are

• Problem Definition

• Requirement Analysis

• Designing the Solution

• Coding (Implementation)

• Testing and Debugging

• Documentation

• Deployment

• Maintenance

Que-3: What are the main differences between high-leveland low-level programming languages?

Ans:

* High level lang -Easy to read , write, understand; Portable across different system; Slower to execute as compared to low level
* Low level lang-Hard to read , write , understand; Faster to execute; Machine dependent

Que-4: Describe the roles of the client and server in web communication.

Ans:

**Client**

A client is a program that runs on the local machine requesting service from the server. A client program is a finite program means that the service started by the user and terminates when the service is completed.

**Server**

A server is a program that runs on the remote machine providing services to the clients. When the client requests for a service, then the server opens the door for the incoming requests, but it never initiates the service.

Que-5: Explain Client Server Communication.

Ans: In Client–Server Communication client (user program) requests services or data, and a server (provider program) processes the request and sends a response over a network.

• **Client**: Sends requests to the server. Example: Web browser.

• **Server**: Receives requests, processes them, and sends responses.

Example: Web server.

Que-6: How does broadband differ from fiber-optic internet?

Ans:

**{Broadband}**

• High-speed internet connection delivered through various mediums

• Higher compared to fiber.

• Usually cheaper than fiber.

• Widely available in cities and rural areas

**{Optical fiber}**

• Internet delivered using fiberoptic cables that transmit data as pulses of light.

• Very low latency.

• Generally more expensive.

Que-8:What are the differences between HTTP and HTTPS protocols?

Ans:

* **HTTP**
  1. It is also known as Hypertext Transfer Protocol
  2. Vulnerable to hacking, eavesdropping, and man-in- the-middle attacks
  3. Slightly faster
  4. URL Format http://
  5. No encryption; data is sent as plain text
* **HTTPS**

1. It is also known as Hypertext Transfer Protocol Secure
2. Protects data from interception and tampering.
3. Slightly slower due to encryption, but often negligible.
4. URL FORMAT https://
5. Encrypted using SSL/TLS for secure communication

Que-9: What is the role of encryption in securing applications?

Ans: Encryption is the process of converting readable data (plaintext) into an unreadable format using a cryptographic key. Only authorized users with the correct key can decrypt the data back into its original form.

Que-10: What is the difference between system software and application software?

Ans:

* **System Software**

1. Software that manages computer hardware and provides a platform for running applications.
2. IT Controls and operates computer hardware, enabling other software to run.
3. Example: Operating systems
4. (Windows, Linux)

* **Application Software**

1. Software designed to help users perform specific tasks or activities.
2. It Performs particular functions for the user.
3. Example: MS Word, Photoshop

Que-11: What is the significance of modularity in software architecture?

Ans:

• Improves maintainability

• Enables reusability

• Makes debugging and testing easier

• Allows parallel development

• Provides better organization

Que-12: Why are layers important in software architecture?

Ans:

• Improves organization of code

• Separates concerns for easier maintenance

• Supports reusability of components

• Simplifies testing and debugging

• Increases flexibility for future changes

• Improves security by isolating functions

Que-13: Explain the importance of a development environment in software production.

Ans: Importance of a Development Environment in Software Production

• Provides necessary tools for coding and debugging

• Ensures consistency across the development team

• Speeds up development with automation features

• Allows testing in a controlled setup

• Supports integration with version control systems

• Helps identify and fix errors early

Que-14: What is the difference between source code and machine code?

Ans:

* **Source Code**

1. Human-readable instructions written in a programming language
2. Easy for humans to read and understand.
3. Needs to be translated into machine code before execution
4. Example : print("Hello World") in Python, C, Java.

* **Machine Code**

1. Binary instructions (Os and 1s) understood directly by the computer's CPU.
2. Difficult for humans to read and understand.
3. Can be executed directly by the computer.
4. Example: 10110100 00000001 (binary code).

Que-15: Why is version control important in software development?

Ans:

• Tracks changes made to code over time

• Allows collaboration among multiple developers

• Helps revert to previous versions when needed

• Prevents loss of work through backups

• Makes it easier to identify and fix bugs

• Supports working on multiple features in parallel

• Maintains a clear history of project development

Que-16: What are the benefits of using Github for students?

Ans: Benefits of Using GitHub for Students :

• Provides free cloud storage for code and projects

• Offers collaboration tools for group assignments

• Tracks changes and maintains version history

• Allows showcasing projects to potential employers

• Gives access to open-source projects for learning

• Integrates with various development tools

• Offers free student benefits through GitHub Student Pack

Que-17: What are the differences between open-source and proprietary software?

Ans**:**

* **Open source**

1. Source code is publicly available.
2. Usually free to use.
3. Users can modify and improve the software.
4. Example: Linux, LibreOffice, GIMP.

* **Proprietary software**

1. Source code is kept private.
2. Often requires purchase or license fee.
3. Modification is not allowed without permission.
4. Example: Windows, Microsoft Office, Photoshop.

Que-18: How does GIT improve collaboration in a software development team?

Ans: git improves collaboration in a software development team by

• Tracks all changes made to the codebase

• Allows multiple developers to work on the same project simultaneously

• Supports branching for developing new features without affecting main code

• Merges changes from different team members efficiently

• Maintains a history of who made which changes and why

• Helps resolve conflicts when changes overlap

• Enables reverting to previous versions if issues occur

Que -19: What is the role of application software in businesses?

Ans: Role of Application Software in Businesses

• Automates routine business tasks

• Improves productivity and efficiency

• Facilitates data storage, management, and analysis

• Enhances communication and collaboration

• Supports decision-making with accurate information

• Improves customer service and engagement

• Reduces operational errors and costs

Que-20: What are the main stages of the software development process?

Ans: Main Stages of the Software Development Process

• Requirement analysis

• System design

• Implementation

• Testing and debugging

• Deployment

• Maintenance and updates

Que 21: Why is the requirement analysis phase critical in software development?

Ans: The requirement analysis phase is critical in software development because it identifies the needs and expectations and ensuring that the project starts with clear objectives.

Que 22: What is the role of software analysis in the development process?

Ans: The role of software analysis in the development process is to study and understand user requirements, define system functionalities, and identify constraints, ensuring the software is well-planned and meets the needs before design and coding begin.

Que 23: What are the key elements of system design?

Ans: Key Elements of System Design :

• System architecture design

• Data design

• Interface design

• Process design

• Security design

Que 24: Why is software testing important?

Ans: Software testing is important because it helps identify and fix errors, ensures the software works as intended, improves quality and reliability, and increases user confidence before deployment.

Que 25: What types of software maintenance are there?

Ans: The steps to maintain the software are :

• Corrective maintenance

• Adaptive maintenance

• Perfective maintenance

• Preventive maintenance

Que 26: What are the key differences between web and desktop applications?

Ans: Key Differences between Web and Desktop are:

• Platform dependency

• Installation requirement

• Accessibility

• Update process

• Performance

• Internet requirement

• Storage location

Que 27: What are the advantages of using web applications over desktop applications?

Ans: Advantages of Using Web Applications over Desktop

Applications :

• Accessible from any device with an internet connection

• No installation required

• Easy and quick updates for all users

• Cross-platform compatibility

• Centralized data storage

• Easier collaboration and sharing

• Lower hardware requirements

Que 28: What role does UI/UX design play in application development?

Ans: UI/UX design plays a crucial role in application development by ensuring the app is easy to use, visually appealing, and provides a smooth user experience, which increases user satisfaction, engagement, and overall success of the application.

Que 29: What are the differences between native and hybrid mobile apps?

Ans : Native mobile apps

• Built for a specific platform like android and ios

• High performance and responsiveness

• Separate updates needed for each platform

• Smooth, optimized for the platform

Hybrid mobile apps

• Works on multiple platforms with one codebase

• Slightly slower than native

• Centralized updates for all platforms

• May feel less seamless than native

Que 30: What is the significance of DFDs in system analysis?

Ans: The significance of DFDs (Data Flow Diagrams) in system analysis is that they show how data moves through a system, helping to understand processes, data inputs/outputs, and storage, which makes analyzing and designing systems easier.

Que 31: What are the pros and cons of desktop applications compared to webapplications?

Ans: **Pros**

• Data can be stored locally for more control

• Can be accessed from any device with internet

• Updates are instant and available to all users

• Lower installation and maintenance costs

**Cons**

• Risk of data loss if local storage is compromised

• Requires stable internet connection

• Performance may depend on server and network speed

• May have reduced performance compared to desktop apps

Que 32: How do flowcharts help in programming and system design?

Ans: Flowcharts help in programming and system design by visually representing the sequence of steps, decisions, and processes, making it easier to understand, analyze, and communicate the logic of a program or system.