**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.

Oue-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-level and low-level programming languages?

Ans:

|  |  |
| --- | --- |
| High level language | Low level language |
| * Easy to read, write, and understand for humans * Slower in execution. * Examples: Python, Java, C++. | * Difficult for humans to read and write. * Faster in execution * Examples: Assembly, Machine code.  |  | | --- | |  |  |  | | --- | |  | |

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 fiber-optic 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 HTTPS

|  |  |
| --- | --- |
| It is also known as HyperText Transfer Protocol | It is also known as HyperText Transfer Protocol Secure |
| Vulnerable to hacking, eavesdropping, and man-in-the-middle attacks | Protects data from interception and tampering. |
| Slightly faster | Slightly slower due to encryption, but often negligible. |
| |  | | --- | | **URL Format** |  |  | | --- | | http:// | | |  | | --- | | **URL Format** |  |  | | --- | | https:// | |
| No encryption; data is sent as plain text. | 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 | Application Software |
| Software that manages computer hardware and provides a platform for running applications. | Software designed to help users perform specific tasks or activities. |
| IT Controls and operates computer hardware, enabling other software to run. | It Performs particular functions for the user. |
| Example: Operating systems (Windows, Linux) | 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 | | Machine Code |
| Human-readable instructions written in a programming language | Binary instructions (0s and 1s) understood directly by the computer’s CPU. |
| Easy for humans to read and understand. | Difficult for humans to read and understand. |
| Needs to be translated into machine code before execution. | |  | | --- | |  |  |  | | --- | | Can be executed directly by the computer. | |
| Example :   |  | | --- | |  |  |  | | --- | | print("Hello World") in Python, C, Java. | | 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** | **Proprietary software** |
| |  | | --- | |  |  |  | | --- | | Source code is publicly available. | | Source code is kept private. |
| |  | | --- | |  |  |  | | --- | | Usually free to use. | | Often requires purchase or license fee. |
| Users can modify and improve the software. | Modification is not allowed without permission. |
| Example:  Linux, LibreOffice, GIMP. | 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

Oue-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 thoroughly examine and understand the problem, requirements, and constraints before designing the solution. It involves studying user needs, system functionalities, and technical feasibility to ensure the software run properly.

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 ensures that the software works as intended and meets user requirements. It helps detect and fix bugs before the product is released, improving the overall quality, reliability, and security of the application.

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 vital role in application development by enhancing user satisfaction and engagement through intuitive and visually appealing interfaces. It improves usability and accessibility, ensuring that users can navigate the application smoothly and efficiently.

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

Ans:

|  |  |
| --- | --- |
| **Native mobile apps** | **Hybrid mobile apps** |
| Built for a specific platform  Like android and ios | Works on multiple platforms with one codebase |
| High performance and responsiveness | Slightly slower than native |
| Separate updates needed for each platform | Centralized updates for all platforms |
| Smooth, optimized for the platform | May feel less seamless than native |

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

Ans: The significance of Data Flow Diagrams (DFDs) in system analysis is that they visually represent how data moves within a system, showing inputs, processes, outputs, and storage points.

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

Ans:

|  |  |
| --- | --- |
| **Pros** | **Cons** |
| Data can be stored locally for more control | Risk of data loss if local storage is compromised |
| Can be accessed from any device with internet | Requires stable internet connection |
| Updates are instant and available to all users | Performance may depend on server and network speed |
| Lower installation and maintenance costs | |  | | --- | | May have reduced performance compared to desktop apps |   Ask ChatGPT |

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 involved in a program or system. They make complex logic easier to understand by breaking it into clear, graphical symbols and flows. This improves communication between developers, designers reduces misunderstandings, and helps identify errors or inefficiencies early. Flowcharts also serve as a useful reference during coding and debugging, ensuring that the final implementation follows the planned logic accurately.