- **Module 1 – Overview of IT Industry**

Q-1 Explain *in your own words what a program is and how it functions.*

A program is a set of instructions written in a programming language that a computer can execute to perform a specific task. It works by taking input, processing it, and producing output based on logical operations.

Write a simple "Hello World" program in two different programming languages of your choice. Compare the structure and syntax.

1) C Program:

```
#include <stdio.h>
int main() {
   printf("Hello World");
   return 0;
}
```

2) Python Program:

```
print("Hello World")
```

Comparison:
- C requires structure, header file, main function, and semicolons.
- Python is simpler and does not require a main function.

Q2. What are the key steps involved in the programming process?
Types

Understanding the problem
2. Planning the solution
3. Writing the code
4. Testing the program
5. Debugging errors
6. Deploying the program
7. Maintaining and updating

Q-3 what are the main differences between high-level and low-level programming languages?

High-Level: Easy to read, close to human language, portable (Python, Java). Low-Level: Close to machine code, fast, hardware-dependent (Assembly).

Q-4 Describe the roles of the client and server in web communication

Client sends requests, server processes the request and returns data.

Q-5 Explain the function of the TCP/IP model and its layers.

Transport, Internet, Network Access. It ensures data moves safely between devices.

Q-6 Explain Client Server Communication

Clients request services and servers respond by serving resources like data or files.

Q-7 How does broadband differ from fiber-optic internet?

Broadband uses copper cables, slower. Fiber uses light signals, much faster and more stable.

Q-8 what are the differences between HTTP and HTTPS protocols?

HTTP is not encrypted; HTTPS is secure with SSL/TLS encryption.

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

Encryption protects data by converting it into unreadable form, ensuring security.

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

System software manages hardware (OS). Application software helps users perform tasks (browser, games).

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

Modularity means breaking software into small components for easier development and maintenance.

Q-12Why are layers important in software architecture?

Layers separate responsibilities, making systems easier to maintain and scale.

Q-13Explain the importance of a development environment in software production

A development environment provides tools, libraries, and setup required to write and test software.

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

Source code is human-readable. Machine code is binary instructions understood by computers.

Q-15Why is version control important in software development?

Version control tracks code changes, supports teamwork, and avoids data loss.

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

It helps in learning collaboration, storing projects, and building a portfolio.

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

Open-source is free and modifiable. Proprietary is paid and closed-source.

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

Git allows branching, merging, and tracking changes, enabling team collaboration.

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

Application software improves productivity, automation, and decision-making.

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

1. Requirement Analysis
2. Design
3. Development
4. Testing
5. Deployment
6. Maintenance

Q-21Why is the requirement analysis phase critical in software development?

It ensures developers understand what the user needs before development.

Q-22What is the role of software analysis in the development process?

Analysis determines system requirements, functionality, and constraints.

Q-23What are the key elements of system design?

Architecture, data flow, database design, UI, security, and components.

Q-24Why is software testing important?

Testing finds bugs and ensures software works correctly.

Q-25What types of software maintenance are there?

1. Corrective
2. Adaptive
3. Perfective
4. Preventive

Q-26What are the key differences between web and desktop applications?

Web runs in browser. Desktop installs locally. Web is accessible anywhere; desktop is faster.

Q-27What are the advantages of using web applications over desktop applications?

No installation, automatic updates, cross-device accessibility.

Q-28What role does UI/UX design play in application development?

UI/UX makes apps easy to use, increasing user satisfaction.

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

Native is platform-specific and faster. Hybrid works on multiple platforms but slightly slower.

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

DFDs show how data moves through a system, improving clarity.

Q-31What are the pros and cons of desktop applications compared to web applications?

Pros: Fast, works offline. Cons: Needs installation, device-specific.

Q-32 How do flowcharts help in programming and system design?

Flowcharts help in programming and system design by providing a clear, visual representation of the steps, decisions, and flow of a process. They make it easier to understand logic, plan programs, identify errors, and communicate ideas. In system design, flowcharts break complex systems into simple parts, show the flow of data, and help teams understand how the entire system works