- **Software Engineering:**
  - Software Development Lifecycle Phases (Requirement analysis, In-depth planning, Product design, Coding, Testing, Deployment, Post-production maintenance)
  - Basic Software Testing Concepts (Black Box Testing, White Box Testing, Unit/Integration/Regression Testing, and UAT).
  - Design Patterns and SOLID principles.
- **Databases:**
  - **Basic Database Concepts:** Relational DBMS, ER Diagram, Transactions (ACID Properties), Keys (Primary, Foreign, Candidate, Alternate etc.), Indexes, Normalization and Joins.
- **Basic questions based on different types of web application attacks like:** Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF), Injection Attacks, DDoS (Distributed Denial-of-Service), Brute Force Attack etc.
  - Tree Traversal strategies like Breadth and Depth First Search
  - Questions based on Data Structures with code snippets
  - Digital Signatures use case and importance
  - Public-Private Key Encryption Symmetric and Asymmetric Keys
  - Digital Signatures use case and importance
  - Public-Private Key Encryption
  - OWASP 10 Web-Security Risks
  - Database related question based on:
    - DDL, DML and TCL commands
    - Basic of SQL Functions
    - Views, Triggers and Cursors
  - Monolith vs Microservice architecture.

2. <u>Infra Support</u>

- Basics of Operating Systems:
  - System calls, processes, threads, inter-process communication, concurrency and synchronization. Deadlock. Memory management and virtual memory.
  - CPU scheduling Algorithms (FCFS, SJF, SRTF, Round Robin etc.).
  - Types of memories: cache, main memory and secondary storage.
  - Concept of Paging and Page Replacement Algorithms: (FIFO, Optimal page replacement, LRU etc.)
  - I/O Scheduling algorithms (FCFS, SSTF, SCAN, LOOK, CSCAN, CLOOK etc.)
- Basics of virtual machines, storage solutions, and networking components.
- Infra related concepts like processors, Clock Cycle, Cache Memory, HDD, SSD etc.
- Backup and Recovery practices
- Best practices pertaining to security and compliance controls.
- Windows and Unix/Linux computing environments.

3. <u>Networking</u>

- Types of Networks (LAN, WAN, MAN etc)
- Network Topologies (Ring , Mesh, Bus, Star, etc)
- Network Devices (Hub, Bridge, Routers, Gateway, etc)
- OSI Data Model, TCP/IP Model
- Subnets and Supernets
- UDP, TCP, sockets and ports.
- IPv4 vs IPv6
- Classless inter-domain routing.
- IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT)
- Application layer protocols: DNS, SMTP, HTTP, FTP, etc.
- Internet Application Protocols (FTP, Telnet, SMTP, SNMP, POP3 etc).
- **Different types of Network Security Protections:**
  - Firewall, Access Control, Remote Access VPN
  - Types of Firewall
  - Access Control

4. <u>Cloud</u>

- Cloud Computing
- Characteristics of Cloud computing
- Types of Cloud Services (SAAS, PAAS, IAAS)
- Public vs Private Cloud
- Virtualization
- Distributed Parallel vs Cloud Computing
- Containerization
- Types of Virtualization
  - Server-based vs Hypervisor-based virtualization
  - Type 1 vs Type 2 virtualization
  - Full vs Para virtualization
- Virtual Machines vs Containers
- Continuous Integration and Continuous Delivery (CI/CD)