**1. What are the different phases of the Software Development Life Cycle (SDLC)?**

**Answer:** The SDLC consists of the following phases:

* **Requirement Analysis** – Gathering user needs.
* **Planning** – Defining scope, budget, and timeline.
* **Design** – Creating system architecture and UI.
* **Implementation (Coding)** – Writing the actual code.
* **Testing** – Ensuring software works correctly.
* **Deployment** – Releasing the software to users.
* **Maintenance** – Updating and fixing issues after release.

**2. What is the purpose of requirement analysis in SDLC?**

**Answer:** It helps in understanding the functional and non-functional requirements of the software, ensuring clarity in project goals and reducing future errors.

**3. How does the testing phase contribute to software quality?**

**Answer:** Testing identifies bugs, ensures functionality, and improves reliability, security, and performance of the software.

**4. What is the difference between SDLC and STLC (Software Testing Life Cycle)?**

**Answer:**

* **SDLC** focuses on the entire software development process.
* **STLC** is specifically related to testing and verification of the software.

**5. Can you explain the difference between the Waterfall model and the Agile model?**

**Answer:**

* **Waterfall Model** – Linear and sequential, each phase is completed before moving to the next.[ FOR SMALL PROJECTS ]
* **Agile Model** – Iterative and flexible, allows changes during development.[ SCRUM MEETING, FOR LARGE PROJECT]

**6. What is the significance of the maintenance phase in SDLC?**

**Answer:** It ensures the software remains functional, secure, and updated after deployment.

**7. How does DevOps fit into the software development life cycle?**

**Answer:** DevOps integrates development and operations, automating deployments, testing, and monitoring for continuous delivery.

**8. What is the role of a feasibility study in software development?**

**Answer:** It assesses technical, economic, legal, and operational feasibility before starting development.

**9. What are the key deliverables at each stage of SDLC?**

**Answer:**

* **Requirement Analysis** – Requirement Specification Document
* **Design** – System Architecture, UI Design
* **Development** – Source Code
* **Testing** – Test Cases, Bug Reports
* **Deployment** – Release Notes
* **Maintenance** – Updates, Patches

**10. What are the different types of testing in SDLC?**

**Answer:**

* Unit Testing
* Integration Testing
* System Testing
* Acceptance Testing
* Performance Testing
* Security Testing

**Computer Generations**

**11. What are the five generations of computers?**

**Answer:**

* **First Generation (1940-1956)** – Vacuum Tubes
* **Second Generation (1956-1963)** – Transistors
* **Third Generation (1964-1971)** – Integrated Circuits (ICs)
* **Fourth Generation (1971-Present)** – Microprocessors
* **Fifth Generation (Present & Beyond)** – AI and Quantum Computing

**12. How did the first generation of computers differ from the second generation?**

**Answer:**

* First-generation used vacuum tubes, consumed more power, and were slow.
* Second-generation used transistors, which were smaller, faster, and more efficient.

**13. What were the main technologies used in third-generation computers?**

**Answer:** Integrated Circuits (ICs) replaced transistors, increasing speed and reducing size.

**14. How has the introduction of microprocessors changed computer technology?**

**Answer:** It led to smaller, faster, and more affordable personal computers.

**15. What are the key characteristics of fifth-generation computers?**

**Answer:** AI capabilities, quantum computing, natural language processing, and advanced parallel processing.

**16. What role did vacuum tubes play in first-generation computers?**

**Answer:** They acted as electronic switches but generated excessive heat and were inefficient.

**17. What advancements were introduced in fourth-generation computers?**

**Answer:** Microprocessors, improved storage, GUI-based operating systems, and personal computing.

**18. How has artificial intelligence influenced modern computer generations?**

**Answer:** AI has enabled automation, deep learning, decision-making, and robotics.

**19. What is the impact of quantum computing on future computer generations?**

**Answer:** Quantum computers can solve complex problems faster than classical computers.

**20. How do modern supercomputers compare to earlier computer generations?**

**Answer:** They have extreme processing power, parallel computing, and are used for scientific research and AI.

**Development Methodologies**

**21. What are the major software development methodologies?**

**Answer:**

* Waterfall
* Agile
* Scrum
* Kanban
* Spiral
* Extreme Programming (XP)

**22. How does Agile methodology improve software development?**

**Answer:** It allows flexibility, continuous feedback, and faster delivery of software.

**23. What is the difference between Scrum and Kanban?**

**Answer:**

* **Scrum** – Follows sprints with defined goals.
* **Kanban** – Uses a continuous workflow with real-time updates.

**24. What are the advantages and disadvantages of the Waterfall model?**

**Answer:**

* **Advantages:** Simple, well-documented, easy to manage.
* **Disadvantages:** Rigid, no flexibility, late-stage issue detection.

**25. How does the Spiral model ensure risk management in software development?**

**Answer:** It includes repeated risk analysis in every cycle, reducing project failure chances.

**26. What is the significance of the V-Model in software testing?**

**Answer:** It ensures each development phase has a corresponding testing phase, improving software quality.

**27. How does the Prototype model help in requirement gathering?**

**Answer:** It creates a working model of the software, allowing users to give feedback before final development.

**28. What are the key principles of Extreme Programming (XP)?**

**Answer:** Frequent releases, continuous testing, pair programming, and customer involvement.

**29. How does Rapid Application Development (RAD) differ from traditional SDLC models?**

**Answer:** RAD focuses on prototyping and user feedback, making it faster and more flexible.

**30. What are the main benefits of using Lean Software Development?**

**Answer:** It reduces waste, improves efficiency, and delivers high-quality software with minimal resources.