Questions:

Define Software Engineering:

Answer:

Software Engineering is a systematic application of engineering principles, methods and tools to the development and maintainance of quality software systems. It involves the design, development, testing,deployment and maintainance of software products.

What is software engineering, and how does it differ from traditional programming?

Answer:

Software Engineering is the design, development, deployment, testing and maintenance of software products.The traditional

Software Development Life Cycle (SDLC):

Explain the various phases of the Software Development Life Cycle. Provide a brief description of each phase.

Answer:

The various stages of software development lifecycle are:

1. Initiation

At this stage you define the project goals and objectives.You will also conduct feasibility studies and identify stakeholders.

2. Planning:

You develop the project management plan, define the scope,schedule and budget of the project.

3. Execution:

This the stage were you assign task to the team members and implement project plan.You will also have to communicate with the team and manage the team to ensure that quality assurance processes are followed.

4. Monitoringand controlling:

At this stage you will be tracking the progress of the project, do quality control checks and manage changes to scope, cost, and schedule. You will also have to communicate with stakeholders to report feedback.

5. Closure:

At this stage you finalise the project activities, obtain formal acceptance of deliverables, release project resources and document lessons learned and archive project document.

Agile vs. Waterfall Models:

Compare and contrast the Agile and Waterfall models of software development. What are the key differences, and in what scenarios might each be preferred?

Answer:

Agile is an interative and incremental approach to project management and software development.It emphasizes flexibility, collaboration and customer feedback.

Advantages:

Changes can be made quickly and easily.

-Regular feedback to the customer which ensures that you will deliver excatly what the client wants.

Disadvantages:

-

-

Waterfall:

Waterfall is a linear and sequential approach, each phase mus be completed before the next begins.

Advantages:

Clear structure and documentation and it is easy to manage due to its rigibility.

Disadvantage:

It is difficult to accomodate change and testing is done at a later stage.

Requirements Engineering:

What is requirements engineering? Describe the process and its importance in the software development lifecycle.

Answer:

Requirements engineering is the area of systems engineering that deals with the process of gathering, analyzing, specifying, and managing the requirements for a system, product, or service . It is important because it helps achieve the primary objective of making sure that the delivered system meets the customer's needs.

Software Design Principles:

Explain the concept of modularity in software design. How does it improve maintainability and scalability of software systems?

Answer:

Modularity in software design is a technique where complex software is divided into smaller, independent modules, such as functions, classes, or components. It facilitates easier management and understanding of complex systems by breaking them down into digestible parts.

Testing in Software Engineering:

Describe the different levels of software testing (unit testing, integration testing, system testing, acceptance testing). Why is testing crucial in software development?

Answers:

Unit testing is the process where you test the smallest functional unit of code. It is important because it helps ensure that bugs are fixed in smaller portion rather than complex.

Integration testing is a type of software testing where software modules are integrated and tested as a unified group.Integration testing helps to identify and resolve any issues that may arise when components are combined, such as compatibility issues, performance problems, incorrect communication, or data corruption.

System testing is the process in which a quality assurance team evaluates how the various components of an application interact together in the full, integrated system or application. It helps verifying that the system meets all functional requirements

Acceptance testing is a process that establishes whether an application meets the end user standards based on predetermined characteristics.

Version Control Systems:

What are version control systems, and why are they important in software development? Give examples of popular version control systems and their features.

Answer:

Version Control Systems are software tools that help software teams manage changes to source code over time e.g Visual Studio Code and Codeblocks

Software Project Management:

Discuss the role of a software project manager. What are some key responsibilities and challenges faced in managing software projects?

Answer:

A software project manager is responsible for leading a team of software developers and ensuring that software projects are completed on time, within budget, and to the satisfaction of the stakeholders. They are responsible for planning, executing, and closing projects. This involves defining project scope, creating schedules, allocating resources, managing risks, and monitoring progress.The project manager is also responsible for communicating with stakeholders, including clients, management, and team members, to ensure everyone is on the same page.

Software Maintenance:

Define software maintenance and explain the different types of maintenance activities. Why is maintenance an essential part of the

software lifecycle?

Answer

Software maintenance is the process of changing, modifying, and updating software to keep up with customer needs.

Ethical Considerations in Software Engineering:

What are some ethical issues that software engineers might face? How can software engineers ensure they adhere to ethical standards in their work?

Submission Guidelines: