Assignment 3: Research and compare SDLC models suitable for engineering projects. Present findings on Waterfall, Agile, Spiral, and V-Model approaches, emphasizing their advantages, disadvantages, and applicability in different engineering contexts.

Solution:-

Waterfall Model:

Advantages:

1.Sequential and linear approach, making it easy to understand and manage.

2.Well-suited for projects with clear and stable requirements upfront.

3.Each phase has specific deliverables, making it easy to measure progress.

Disadvantages:

1.Lack of flexibility; difficult to accommodate changes once a phase is completed.

2.Testing occurs late in the cycle, which can lead to higher costs and risks.

3.Customer feedback is typically gathered at the end, which might result in misalignment with customer expectations.

Applicability: Suitable for projects with well-defined requirements and minimal expected changes, such as infrastructure projects.

Agile Model:

Advantages:

1.Highly flexible and adaptable to changing requirements through iterative development.

2.Customer involvement and feedback are prioritized throughout the process, leading to higher customer satisfaction.

3.Early and continuous delivery of working software components.

Disadvantages:

1.Requires active and continuous involvement of stakeholders, which might be challenging in certain environments.

2.Initial planning might be less detailed, leading to potential scope creep.

3.Might not be suitable for projects with strict regulatory requirements or fixed deadlines.

Applicability: Ideal for projects where requirements are expected to evolve, and rapid delivery of working software is crucial, such as software development projects in dynamic industries.

Spiral Model:

Advantages:

1.Incorporates risk management throughout the project lifecycle.

2.Highly adaptable and allows for iterative development.

3.Provides early prototypes and frequent opportunities for customer feedback.

Disadvantages:

1.Can be complex to manage, especially for small projects.

2.Requires thorough risk analysis and management expertise.

3.Costly to implement due to the iterative nature and risk analysis involved.

Applicability: Best suited for large-scale projects with high risks and uncertainties, such as complex software systems and innovative research projects.

V-Model:

Advantages:

1.Emphasizes the relationship between each phase of development and its corresponding testing phase.

2.Provides early test planning and validation of requirements.

3.Easy to understand and implement, similar to the Waterfall model.

Disadvantages:

1.Limited flexibility; difficult to accommodate changes once the development process has begun.

2.Testing activities might become time-consuming and expensive due to their parallel nature.

3.Customer feedback is typically gathered at the end of the cycle, similar to the Waterfall model.

Applicability: Suitable for projects with clear and stable requirements, where testing

is crucial and can be performed in parallel with development, such as safety-critical systems.