

## SEPM Assignment 1

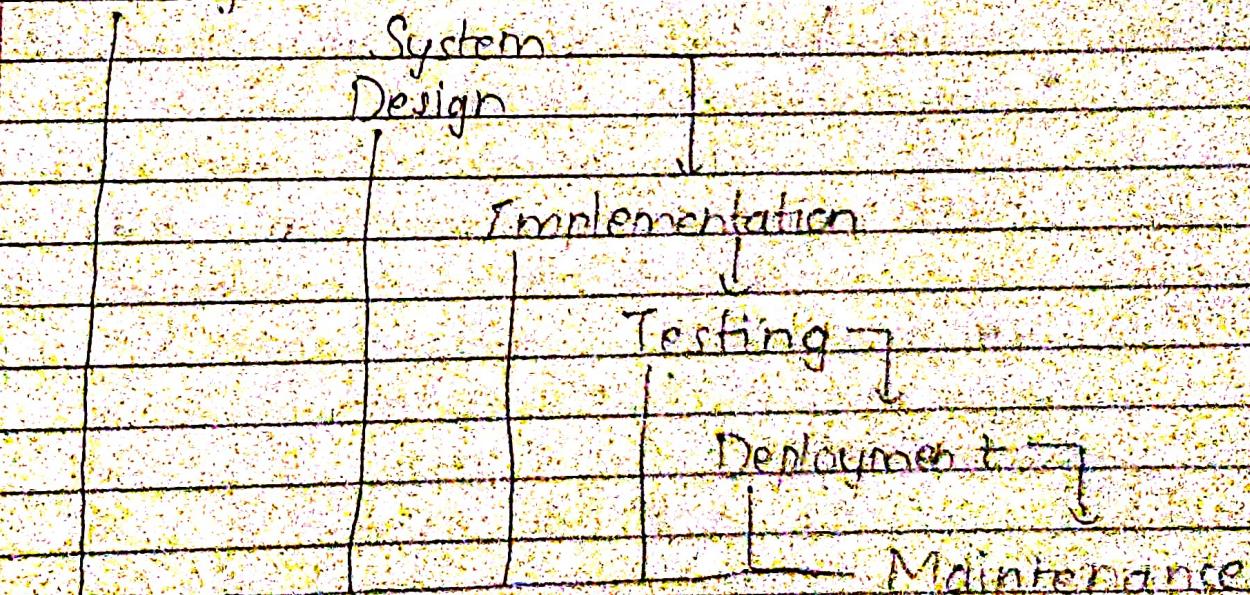
Q) Explain different software process models.

### 1) Waterfall model

- It was the first model to be introduced.
- It is also referred to as a linear sequential life cycle model.
- In this model, each phase has to be completed before the next phase can begin.

Design :

Requirement  
Analysis



The phases are :-

- i) Requirement Gathering & analysis: All possible requirements of the system to be developed are captured in this phase and

documented in a requirement specification document.

- i) System Design: The requirement specifications are studied & system design is prepared. It helps in specifying hardware & system requirements & helps in defining overall architecture.
- ii) Implementation: With input from system design, the system is first developed in small programs called units which are integrated in the next phase. Each unit is developed & tested for its functionality which is referred to as Unit testing.
- iii) Integration & Testing: All units are integrated into a system and then the entire system is tested for any faults & failures.
- iv) Deployment of system: Once all the testing is done, the product is deployed in the customer environment.
- v) Maintenance: Fixing issues that come up in the client environment.

Advantages  
• Applications:

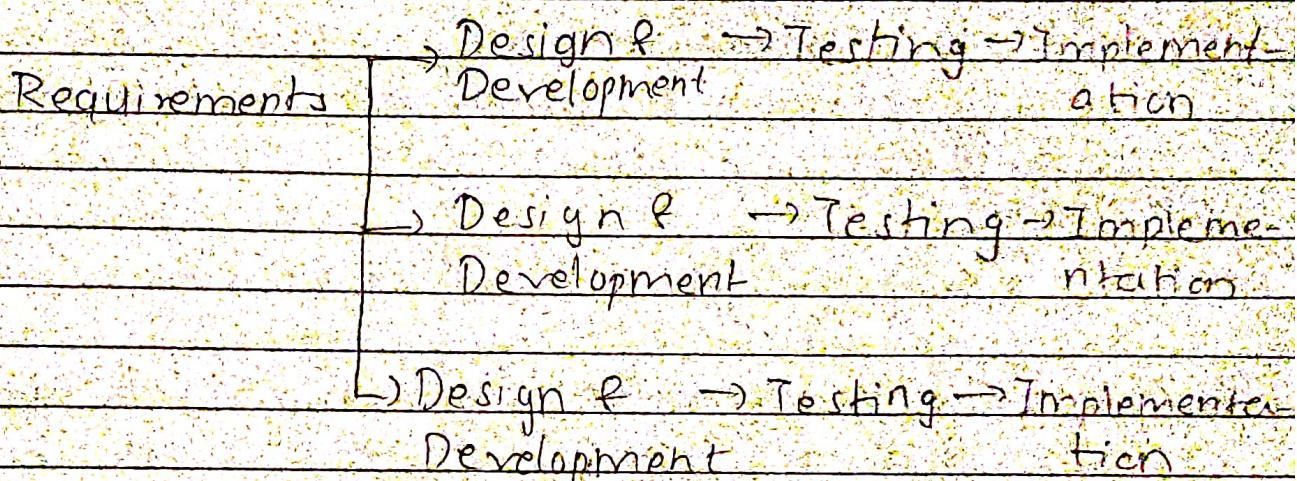
- i) Clearly defined stages
- ii) Easy to manage due to rigidity of model
- iii) Works well for smaller projects
- iv) Process & results are well documented

Disadvantages:

- i) High amounts of risk & uncertainty
- ii) Poor model for long & ongoing projects

## 2. Iterative model / Incremental model

- In this model, an iterative process starts with a simple implementation of a small set of the software requirements & iteratively enhances the evolving versions until the complete system is implemented & ready to be deployed.



- It is a combination of Iterative and Incremental development.
- In this incremental model, the whole requirement is divided into various builds. During each iteration, the development module goes through the requirements, design, implementation & testing phases.
- Each subsequent release of module adds function to the previous release.

### Advantages:

- i) Results are obtained early & periodically.
- ii) Parallel development can be planned.

iii) less costly to change the scope.

#### Disadvantages:

- i) More resources may be required
- ii) More management attention is required
- iii) Not suitable for smaller projects

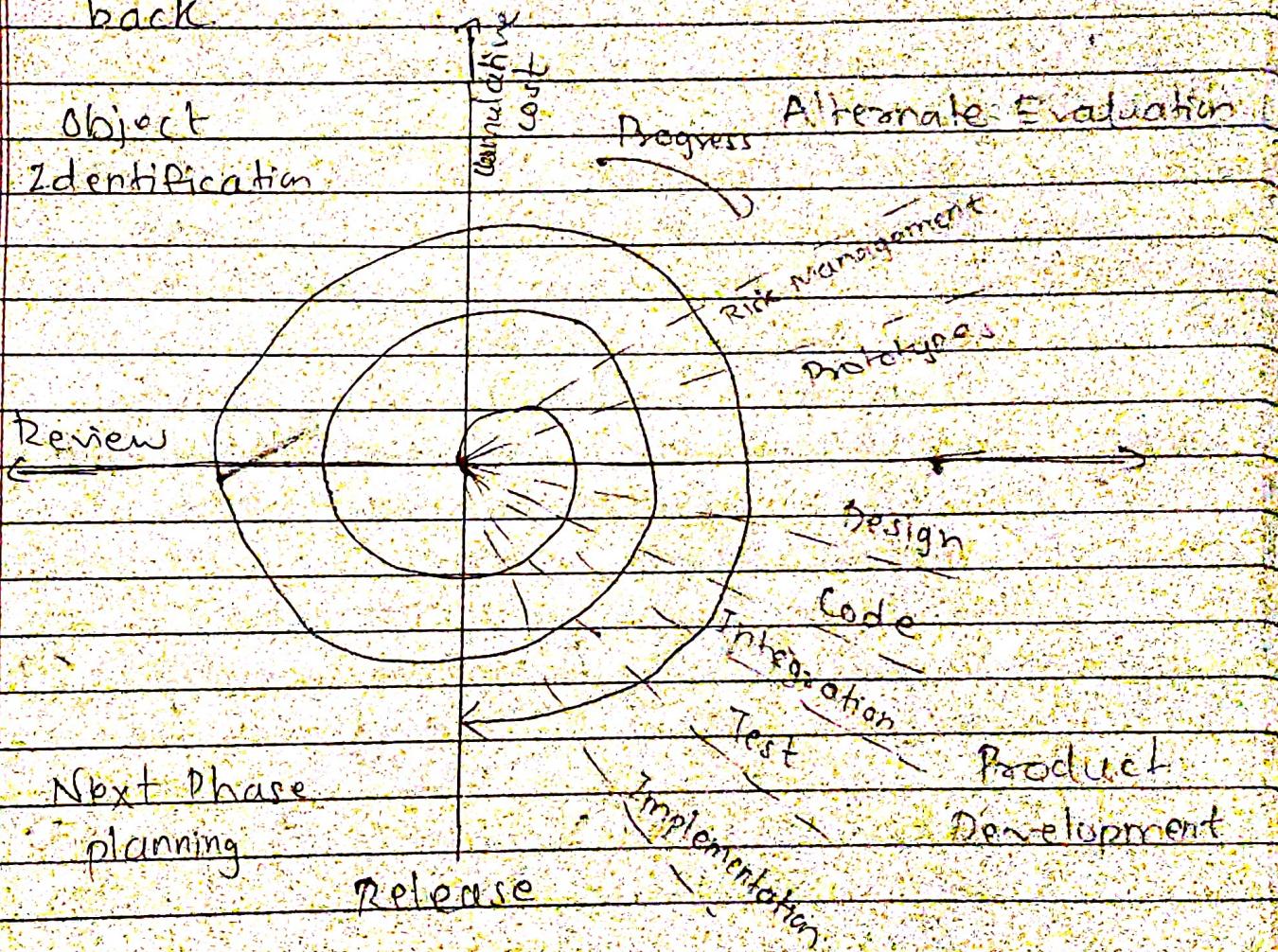
### 3) Spiral Model:

- This model combines the idea of iterative development with the systematic controlled aspects of the waterfall model.

Design - It has 4 phases -

- i) Identification : It starts with gathering the business requirements in the baseline spiral. It also includes understanding the system requirements by continuous communication b/w the customer and system analyst.
- ii) Design : It starts with the conceptual design in the baseline spiral & involves architectural design, logical design of modules, physical product design & the final design in the subsequent spirals.
- iii) Build : Refers to the production of actual software product at every spiral.

iv) Evaluation & Risk Analysis: It includes identifying, estimating & monitoring the technical feasibility and management risks, such as schedule slippage & cost overrun. After testing the build at the end of first iteration, the customer evaluates the software & provides feedback.



#### Advantages:

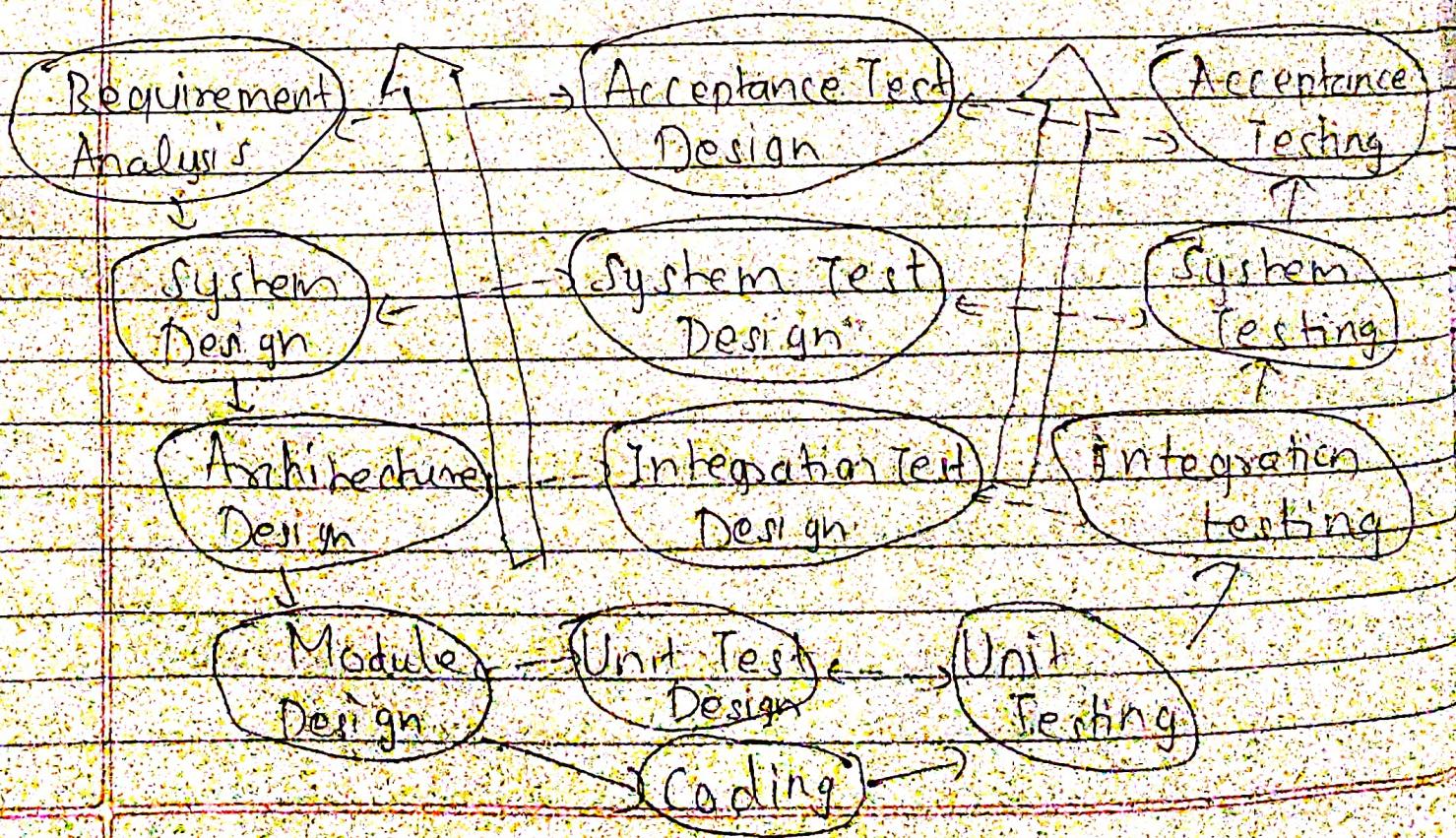
- i) Changing requirements can be accommodated.
- ii) Users see the system early.
- iii) Requirements can be captured more accurately.

## • Disadvantages:

- i) Management is more complex
- ii) Process is complex
- iii) End of the project may not be know early.
- iv) Spiral may go on indefinitely.

## 4) V-Model:

- In this model, the execution of processes happen in a sequential manner in a V-shape. It is also known as Verification and Validation Model.
- It is an extension of waterfall model and is based on the association of a testing phase for each corresponding development stage.



The phases are :

Business Requirement Analysis : It involves detailed communication with the customer to understand his expectations and exact requirement. The acceptance test design planning is done at this stage as business requirements can be used as an input for acceptance testing.

- i) System Design : It will have the understanding & detailing the complete hardware and communication setup for the product under development.
- ii) Architectural Design : Architectural specifications are understood & designed. The system design is broken down further into modules taking up different functionality. It is also referred to as High Level Design (HLD).
- iii) Module Design : Here, the detailed internal design for all system modules is specified, referred to as low level design.
- iv) Coding Phase : The actual coding of the system modules designed in the design phase is taken up in the coding phase.

## vi) Validation Phase

- i) Unit Testing : It is testing at code level and helps eliminate bugs at an early stage.
- ii) Integration Testing : It tests the integrated working of unit modules.
- iii) System Testing : It checks the entire system functionality and communication of system under development.
- iv) Acceptance Testing : It is associated with business requirement analysis phase and involves testing product in user environment.

### Advantages :

- i) It is a highly disciplined model & phases are completed one at a time.
- ii) Simple & easy to understand & use.

### Disadvantages :

- i) High risk and ~~more~~ uncertainty.
- ii) Poor model for long & ongoing projects.
- iii) No working software is produced until late during life cycle.