Software Testing Assignment
Module–1(Fundamental)

1. <u>**What is SDLC?**</u>

   ❖ SDLC- System Development Life Cycle is a step-by-step process used by development team to design, develop high quality product.

2. <u>**What is software testing?**</u>

   ❖ Software Testing is the process of validating and verifying software.

   ❖ Software Testing is the process of evaluating and verifying the functionality of software products or apps to ensure they meet expected requirements and are free from defects.

3. <u>**What is agile methodology?**</u>

   ❖ The Agile methodology is a project management approach that involves breaking the project into phases and emphasizes continuous collaboration and improvement. Teams follow a cycle of planning, executing, and evaluating.

   ❖ It is combination of iterative and incremental process method with focus on process adaptability and customer satisfaction by rapid delivery of working software product.

4. <u>**What is SRS?**</u>

   ❖ A software requirement specification is a complete description of the behavior of that system to be developed.

   ❖ It includes a set of use cases that describe all of the interactions that the user will have with the software.

   ❖ Requirements that include are Customer requirements, functional requirements and non-Functional Requirements.

5. <u>**What is oops?**</u>

   ❖ Oop is an object-oriented programming.

   ❖ Object oriented programing is the programing language which is used for designing program using classes and objects.

   ❖ Object-Oriented Programming or OOPs refers to languages that use objects in programming, they use objects as a primary source to implement what is to happen in the code. Objects are seen by the viewer or user, performing tasks assigned by you.

6. <u>**Write Basic Concepts of oops**</u>

   ❖ Object
   ❖ Class
   ❖ Encapsulation
   ❖ Inheritance
   ❖ Polymorphism
   - Overriding
   - Overloading
   ❖ Abstraction

7. **What is object**

   ❖ An object is an individual, identifiable unit or entity with well-defined role in the problem domain.

   ❖ An object is anything to which a concept applies.

8. **What is class**

   ❖ A collection of objects is called a class.

   ❖ A class represents an abstraction of the object and abstracts the properties and behavior of that object.

   ❖ Class can be considered as the blueprint for an object and describes the properties and behavior of that object, but without any actual existence.

9. **What is encapsulation**

   ❖ Encapsulation is integrating data and codes into a single unit; and the unit here is a class.

   ❖ The data of a class is hidden from other class.

   ❖ Encapsulation is the practice of including in an object everything it needs hidden from other objects. The internal state is usually not accessible by other objects.

   ❖ Encapsulation enables data hiding, hiding irrelevant information from the users of a class and exposing only the relevant details required by the user.
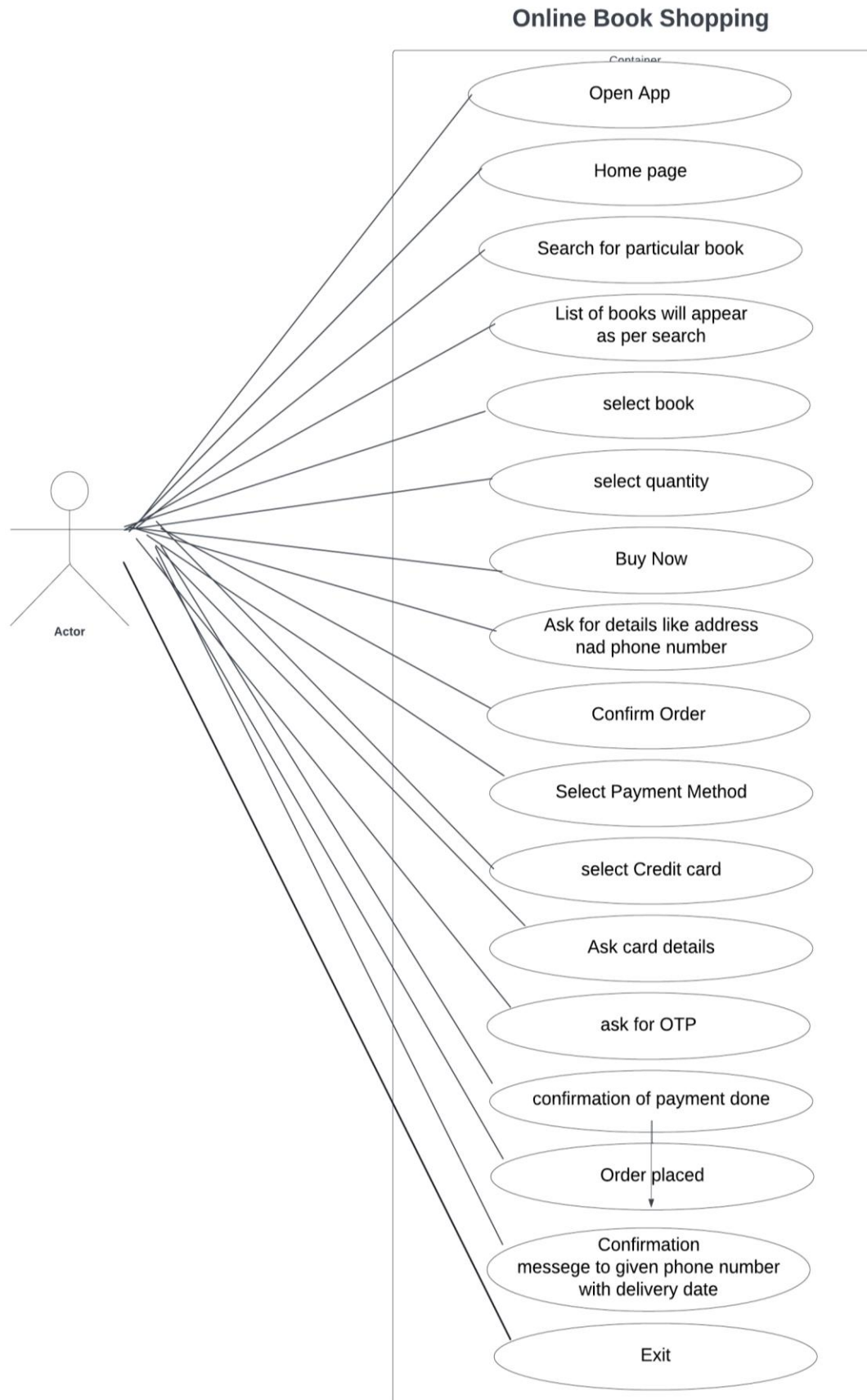
10. **What is inheritance**

    ❖ When one object acquires all the properties and behaviors of a parent object, it is known as inheritance.

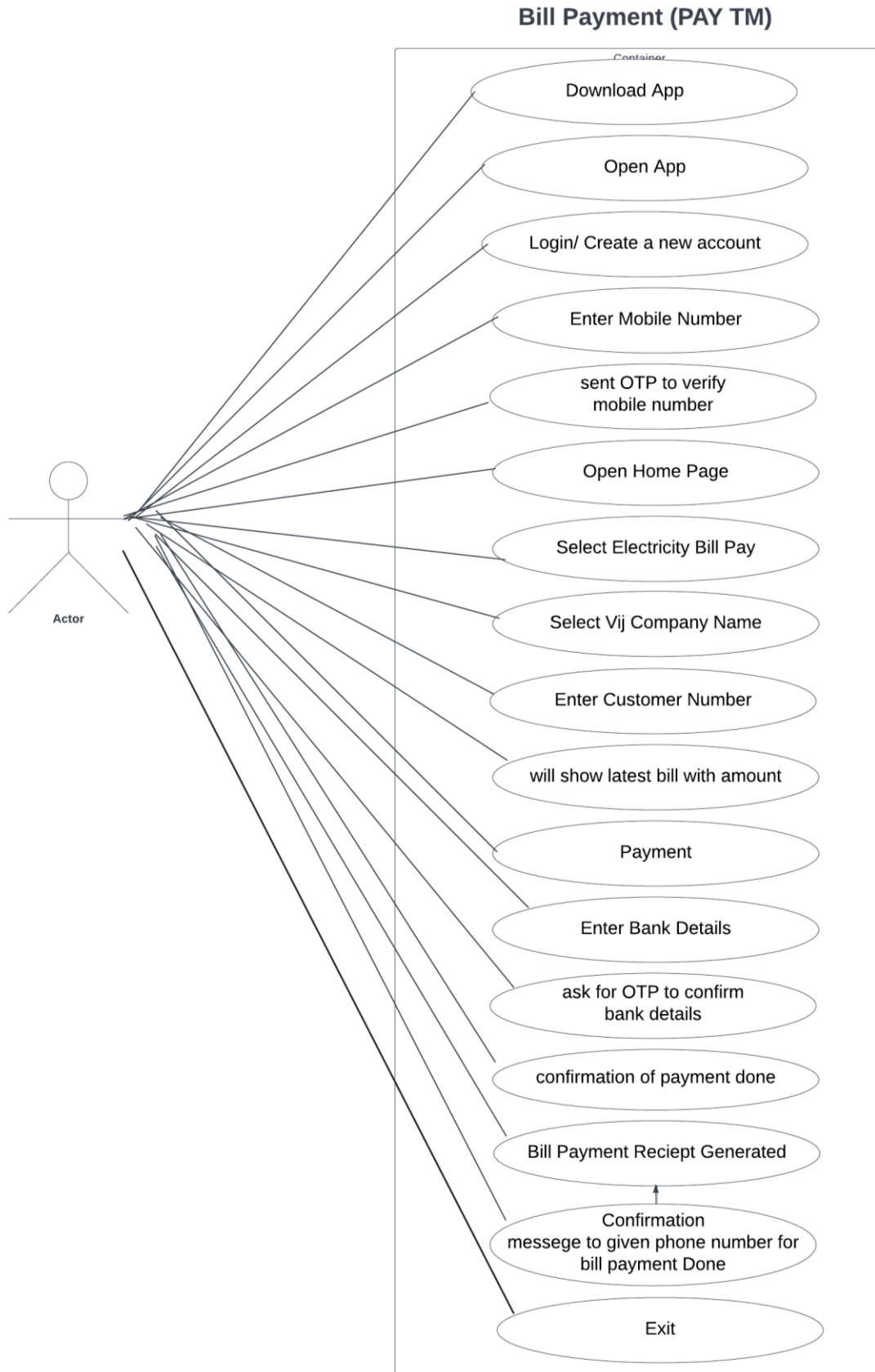   ❖ Inheritance means that one class inherits the characteristics of another class.

11. **What is polymorphism**

    ❖ If one task is performed in different ways, it is known as polymorphism.

    ❖ For example: to convince the customer differently, to draw something, for example, shape, triangle, rectangle, etc.

    ❖ Poly refers to many. That is a single function or an operator functioning in many ways different upon the usage is called polymorphism.

    ❖ In Java, there are two types of polymorphism
      • Overloading (Compile time polymorphism)
      • Overriding (Runtime polymorphism)

**12. Draw Usecase on Online book shopping**

Online Book Shopping

13. Draw Usecase on online bill payment system (paytm)

Bill Payment (PAY TM)

Container

- Download App
- Open App
- Login/ Create a new account
- Enter Mobile Number
- sent OTP to verify mobile number
- Open Home Page
- Select Electricity Bill Pay
- Select Vij Company Name
- Enter Customer Number
- will show latest bill with amount
- Payment
- Enter Bank Details
- ask for OTP to confirm bank details
- confirmation of payment done
- Bill Payment Reciept Generated
- Confirmation messege to given phone number for bill payment Done
- Exit

Actor

14. Write SDLC phases with basic introduction

SDLC Cycle represents the process of developing software.

SDLC framework includes the following Phases.
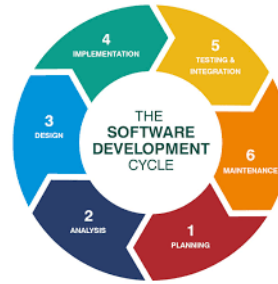
- Requirement gathering and analysis
- Design
- Implementation or coding
- Testing
- Deployment
- Maintenance

1) Requirement Gathering

- ❖ During this phase, all the relevant information is collected from the customer to develop a product as per their expectation. Any ambiguities must be resolved in this phase only.
- ❖ Business analyst and Project Manager set up a meeting with the customer to gather all the information like what the customer wants to build, who will be the end-user, what is the purpose of the product. Before building a product, a core understanding or knowledge of the product is very important.
- ❖ Once the requirement is clearly understood, the SRS (Software Requirement Specification) document is created. This document should be thoroughly understood by the developers and also should be reviewed by the customer for future reference.

2) Analysis

- ❖ The analysis phase is to identifies any potential risks. This step in SDLC also includes a feasibility study, which defines all fortes and weak points of the project to assess the overall project viability.
- ❖ The analysis stage includes:
    - clarifying specific details required for software development
    - determining initial prototype ideas:
    - what functions could be the most suitable for the new product
    - what USPs (Unique Selling Points) your future software should have to compete well on the market.

3) Design

- ❖ In this phase, the requirement gathered in the SRS document is used as an input and software architecture that is used for implementing system development is derived.

4) Implementation or Coding

- ❖ Implementation/Coding starts once the developer gets the Design document. The Software design is translated into source code. All the components of the software are implemented in this phase.

5) Testing

- ❖ Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned to developers to get them fixed.
- ❖ Retesting, regression testing is done until the point at which the software is as per the customer's expectation. Testers refer SRS document to make sure that the software is as per the customer's standard.

6) Maintenance

- ❖ After the deployment of a product on the production environment, maintenance of the product i.e. if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.

15. Explain Phases of the waterfall model

❖ Waterfall model is the very first model that is used in SDLC. It is also known as the linear sequential model.

❖ In this model, the outcome of one phase is the input for the next phase. Development of the next phase starts only when the previous phase is complete.

❖ Winston Royce introduced the Waterfall Model in 1970.

The sequential phases in Waterfall model are –
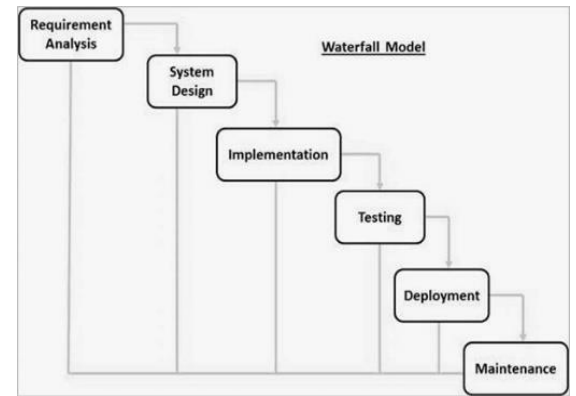
1) Requirement Gathering and analysis
   All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

2) System Design
   The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

3) Implementation
   With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

4) Integration and Testing
   All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

5) Deployment of system
   Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

6) Maintenance
   There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

16. Write phases of spiral model

❖ The spiral model is an SDLC model that combines elements of an iterative software development model to overcome drawbacks of a waterfall model.

❖ It is advisable to use this model for expensive, large and complex projects.

❖ The Spiral Model allows the product to be rolled out and refined in each phase of the spiral, with the ability to build prototypes in each stage. A prototype is created at the beginning of each phase as a risk management technique.

❖ It has four phases: The planning of objectives, risk analysis, engineering or development, and finally review.

❖ A project passes through all these stages repeatedly and the phases are known as a Spiral in the model.
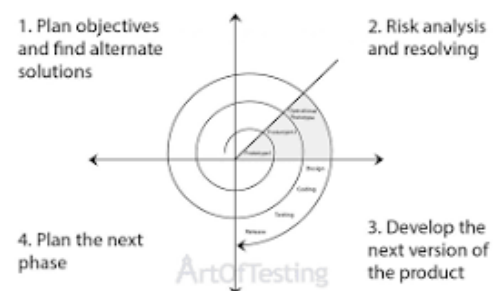
1) Planning: Determine objectives and find alternate solutions
   This phase includes requirement gathering and analysis. Based on the requirements, objectives are defined and different alternate solutions are proposed.

2) Risk Analysis and resolving
   In this quadrant, all the proposed solutions are analyzed and any potential risk is identified, analyzed, and resolved.

3) Engineering: Develop and test
This phase includes the actual implementation of the different features. All the implemented features are then verified with thorough testing.

4) Review and planning of the next phase
In this phase, the software is evaluated by the customer. It also includes risk identification and monitoring like cost overrun or schedule slippage and after that planning of the next phase is started.

17. Write agile manifesto principles

1) Customer satisfaction
Customers need to be satisfied with the quick delivery of the product at the earliest.

2) Welcome change
Even if the change is late in the development process, it needs to be addressed and handled as soon as possible.

3) Deliver frequently
The focus must be on the continuous delivery of software in a shorter timescale.

4) Work together
Business units and developers need to work in tandem throughout the project lifespan.

5) Motivated team
The projects need to have motivated team members. They must also be trusted to get the work done.

6) Face-to-face
Conversations that take place face-to-face have maximum efficiency and effectiveness.

7) Working software
The primary measure of progress is evaluated based on the working software created.

8) Constant pace
The agile process is greatly beneficial when it comes to sustainable development.

9) Good design
Focusing on technological excellence and good design can significantly affect agility.

10) Simplicity
The amount of work not being done needs to be reduced via simpler processes.

11) Self-organized
Self-organized teams end up providing the best architectures, designs, and requirements.

12) Reflection and adjustment
The effectiveness can be significantly improved by regular reflection on it, by the team.

18. Explain working methodology of agile model and also write pros and cons.

- ❖ Agile is an Iterative and Incremental process.
    - o Iterative means same process repeats again and again.
    - o Incremental means we keep on adding new features on the existing process/ software.
- ❖ In this model we can easily change requirements at any stage.
- ❖ There will be good communication between customer, business analyst, developers and tester in this model.
- ❖ Very popular model due to the flexibility and adaptability.

Working Methodology:

- ❖ Agile methods break tasks into smaller iterations, or parts do not directly involve long term planning.
- ❖ The project scope and requirements are laid down at the beginning of the development process.
- ❖ Plans regarding the number of iterations, the duration and the scope of each iteration are clearly defined in advance.
- ❖ Each iteration is considered as a short time "frame" in the Agile process model, which typically lasts from one to four weeks.
- ❖ The division of the entire project into smaller parts helps to minimize the project risk and to reduce the overall project delivery time requirements.
- ❖ Each iteration involves a team working through a full software development life cycle including planning, requirements analysis, design, coding, and testing before a working product is demonstrated to the client.

Pros:

- ❖ Fast Delivery
- ❖ Face-to-Face Communication with clients.
- ❖ Efficient design and fulfils the business requirement.
- ❖ Anytime changes are acceptable.
- ❖ It reduces total development time.
- ❖ Minimum resources required.
- ❖ Easy to manage
- ❖ Realistic approach

Cons:

- ❖ Not suitable for complex dependencies
- ❖ Lack of documentation so difficult to maintain in future
- ❖ High individual dependency as there is minimum documentation

19. Draw usecase on Online shopping product using COD.

Shopping Product using COD

Container

20. Draw usecase on Online shopping product using payment gateway.

Shopping Product using
Payment gatway

Container

Open App

Home page

Search for Product

List of available product
will display

Select food Item

select quantity

Order

Ask for details like address

Login details

Select Payment Method

select Credit card

Ask card details

ask for OTP

confirmation of payment done

Order placed

confirmation messege
to given number

Exit

Actor