Module 1

[1] What is software Engineering ?

- The design, the development, and the maintenance of software.

[2] What is SDLC ?

- Software development life cycle

[3] What is software Development Methodology ?

Software development methodology refers to structured processes involved when working on a project.

1. Waterfall model (Classical software cycle)
2. Iterative model
3. Agile model
4. Bohem's Spiral model
5. Use-case

[4] What is agile methodology ?

- No deadline fix
- Having so many interaction and divide data in categories
- Agile manifesto principles
    1. Individuals and interactions
    2. Working software
    3. Customer collaboration
    4. Responding to change

[5] What is use-Case ?

- A use-case is the specification of a sequence of actions
    - ➔ Actors
    - ➔ Node coverage

[6] What is Activity Diagrams ?

- Activity diagram is basically a flowchart to represent the flow from one activity to another activity.

[7] What is SRS ?

- Software requirements specification

[8] What is Programming ?

- the process of creating a set of instructions that tell a computer how to perform a task.
    - ★ **programming languages**
        - ➔ Python
        - ➔ JAVA
        - ➔ C
        - ➔ C++
        - ➔ C#
        - ➔ PHP
        - ➔ .NET

[9] What is oops ?

- Object oriented programming

[10] Write Basic Concepts of oops ?

1. Object
2. Class
3. Encapsulation
4. Inheritance
5. Polymorphism
    A. Overriding
    B. Overloading
6. Abstraction

[11] What is object ?

- Any living things which has own state and behaviour
  Ex : Pen, Paper Mobile

[12] What is Class ?

- Collections Of objects
  Ex : Human body, Classroom

[13] What is RDBMS ?

- Relational Database Management System

[14] What is SQL ?

- Structured Query Language

[15] Write SQL Commands

- SELECT - extracts data from a database
- UPDATE - updates data in a database
- DELETE - deletes data from a database
- INSERT INTO - inserts new data into a database
- CREATE DATABASE - creates a new database
- ALTER DATABASE - modifies a database
- CREATE TABLE - creates a new table

[16] Write SDLC phases with basic introduction

1)Requirement Gathering:

=>Types of Requirement:
1)Functional Requirement
2)Non Functional Requirement

UML->Unified Modeling Language

2)Analysis

3)Designing(Designer)
=>Web:HTML,CSS,JAVASCRIPT,BOOTSTRAP,JQUERY
=>App:XML

4)Implementation(coding)(Developer)
=>Web:PHP,JAVA,PYTHON,.NET
=>App:Android,Ios

5)Testing:(Tester)
=>Manual -> By Human
=>Automation ->By Software

6)Maintenance:
You Have to Maintain XYZ.

Types of Maintenance:
1)Corrective Manitenance:
2)Perfective Maintenance:
3)Adaptive Maintennance:

[17**] Explain types of requirements**

=>Types of Requirement:

1)Functional Requirement
2)Non Functional Requirement

[18] States the importance of Design phase?

to transform the requirements into complete and detailed system design specifications

[19] What are the tasks performed in coding phase?

During the coding phase, developers **analyze the feasibility of each coding language and begin programming according to coding specifications**

[20] Briefly explain Testing Phase

the software development lifecycle is **where you focus on investigation and discovery**

[21] Explain Phases of the waterfall model

- Short Term project(5 Months)
- Requirements are must be fixed
- Sequence
- At a time you can work with only stage

[22] Write phases of spiral model

- Long Term project(3-4-5 years)
- It works with Long Term Project
- there are totally 4 stages
- Customer have no need of exact requirment
- Manangement is more complex

[23] Write agile manifesto principles

- Individuals and interactions over processes and tools.
- Working software over comprehensive documentation.
- Customer collaboration over contract negotiation.
- Responding to change over following a plan.

[24] What is Actor in Use - Case?

A use case diagram **shows the interaction between the system and entities external to the system**

[25] How many kinds of nodes in Activity Diagrams? Which?

There are **three main types of node**:

1. action nodes
2. object nodes
3. control nodes

[26] What is Encapsulation?

Binding of data or wrapping up of data
ex:capsule

[27] What is polymorphism?

Many ways to perform anything
ex:multiple ways

[28] What is abstraction?

Hiding internal details and showing functionalities
ex:APK file

[29] Why SQL?

SQL is **used to access data within the relational database**

[30] Write sql commands in detail

There are five types of SQL commands: DDL, DML, DCL, TCL, and DQL

1 DDL (Data Definition Language)

- CREATE
- ALTER
- DROP
- TRUNCATE

2 DML (Data Manipulation Language)

- INSERT
- UPDATE
- DELETE

3 DCL (Data Control Language)

4 TCL (Transaction Control Language)

- COMMIT
- ROLLBACK

5 DQL (Data Query Language)

- SELECT

[31] What is join?

JOINs in SQL is **to access data from multiple tables based on logical relationships between them**.

[32] Write type of joins.

four types of joins: **left, right, inner, and outer.**

[33] . **Explain phases of SDLC in detail**

- Requirements Collection/Gathering Establish Customer Needs
- Analysis Model And Specify the requirements
- Design Model And Specify a Solution
- Implementation Construct a Solution In Software
- Testing Validate the solution against the requirements
- Maintenance Repair defects and adapt the solution to the new requirements

[34] According to you which is most creative and challenging phase of system life cycle?

Project planning and requirements are the most fundamental phases of the SDLC. Without understanding the initial requirements, no software team can develop a solution that gives value to clients. Usually, the senior members in a project team are responsible for carrying out requirement analysis

[35] Who are the people involved in the phases of Waterfall Model

Waterfall team is a group of developers that works on realization of Waterfall projects. Such teams are usually large. They include **more than 15 people**.

[36] Explain the team Requirement Gathering concerning SDLC

- ➔ The most important phase of the SDLC is the requirement gathering and analysis phase because this is when the project team begins to understand what the customer wants from the project.
- ➔ During the requirements gathering sessions, **the project team meets with the customer to outline each requirement in detail**

[37] Write applications of iterative and incremental model

- ➔ An example of iterative and incremental development in Agile could be the **creation of a new e-commerce website**
- ➔ When requirements are defined clearly and easy to understand. When the software application is large. When there is a requirement of changes in future

[38] Write pros and cons of iterative and incremental model

pros

- Potential defects are spotted and dealt with early
- Functional prototypes are developed early in the project life cycle
- Less time is spent on documenting and more on designing
- Progress is easily measured
- Changes to project scope are less costly and easier to implement
- Testing is facilitated by the modules being relatively small
- Most risks can be identified during iteration and higher risks can be dealt with as an early priority
- Successive iterations can be managed easily as milestones
- An operational product is delivered with every iteration
- Operating time is reduced
- Customer feedback is based on working products rather than technical specifications

cons

- ore resources may be required
- Each successive phase is rigid with no overlaps
- The need for more intensive project management may be required

- Issues about system architecture may turn out to be a constraining factor because of the lack of a full requirements specification for the entire system
- It may be difficult to pin down an end date for the project conclusion
- Highly skilled talent is required for risk analysis

[39] Write applications of spiral model

- Spiral Model Application

The Spiral Model is widely used in the software industry as it is in sync with the natural development process of any product, i.e. **learning with maturity which involves minimum risk for the customer as well as the development firms**

In this model, **we can easily change requirements at later phases and can be incorporated accurately**. Also, additional Functionality can be added at a later date. It is good for large and complex projects. It is good for customer satisfaction

[40] Explain working methodology of agile model and also write pros and cons.

Agile methodology encourages flexible, rapid progress using iterative development, delivering pieces of the project along the way to ensure customer needs are met. Frequent delivery allows the customer to provide constant feedback, resulting in a higher-quality product. The methodology breaks down large tasks to be completed in specific time frames.

Agile methodology is best suited for projects where teams can work in a timebox and value speed over comprehensive details. Agile requires skill, independent workers, and the opportunity for clients to change project requirements along the way.

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PROS

Revisit: Revisits and rewrites of steps are encouraged to achieve the desired results.

Testing: Agile projects tasks are tested in flight, allowing for faster delivery and a better project.

Customer: Frequent delivery allows for quick changes in project direction while maintaining project scope

CONS

Starting: Agile doesn't set a strict schedule, which, if not managed, can be difficult under a tight deadline.

Finish line: Changing project requirements may cause problems in other areas of the organization.

Reliance: Agile requires a consistent team. A weak link in the Agile team or management could result in wasted time and money.

[41] What is difference between software product and software project.

Product:
In the context of software engineering, Product includes any software manufactured based on the customer's request. This can be a problem solving software or computer based system. It can also be said that this is the result of a project.

Process:
Process is a set of sequence steps that have to be followed to create a project. The main purpose of a process is to improve the quality of the project. The process serves as a template that can be used through the creation of its examples and is used to direct the project.

[42] Explain polymorphism with example

In simple words, we can define polymorphism as **the ability of a message to be displayed in more than one form**. A real-life example of polymorphism is a person who at the same time can have different characteristics. Like a man at the same time is a father, a husband and an employee.

[43] Explain Abstraction with Example

In simple terms, abstraction **"displays" only the relevant attributes of objects and "hides" the unnecessary details**. For example, when we are driving a car, we are only concerned about driving the car like start/stop the car, accelerate/ break, etc

[44] Explain types of inheritance with example

1. Single inheritance
2. Multi-level inheritance
3. Multiple inheritance
4. Multipath inheritance

5. Hierarchical Inheritance
6. Hybrid Inheritance

[45] What is Inner Join?

The most important and frequently used of the joins is the INNER JOIN. They are also referred to as an EQUIJOIN. The INNER JOIN creates a new result table by combining column values of two tables (table1 and table2) based …

[46] Explain left and write join with example.

The main difference between these joins is the inclusion of non-matched rows. **The LEFT JOIN includes all records from the left side and matched rows from the right table, whereas RIGHT JOIN returns all rows from the right side and unmatched rows from the left table**.