UML VIVA Questions and Answers :-

1. What is UML?

UML stands for the Unified Modeling Language.
It is a graphical language for

1. visualizing
2. constructing
3. documenting the artifacts of a system.

It allows you to create a blue print of all the aspects of the system, before actually physically implementing the system.

2. What are the advantages of creating a model?

- Modeling is a proven and well-accepted engineering technique which helps build a model.
- Model is a simplification of reality; it is a blueprint of the actual system that needs to be built.
- Model helps to visualize the system.
- Model helps to specify the structural and behavior of the system.
- Model helps make templates for constructing the system.
- Model helps document the system.

3. What are the different views that are considered when building an object-oriented software system?

Normally there are 5 views.

1. **Use Case view** – This view exposes the requirements of a system.
2. **Design View** – Capturing the vocabulary.
3. **Process View** – modeling the distribution of the systems processes and threads.
4. **Implementation view** – addressing the physical implementation of the system.
5. **Deployment view** – focus on the modeling the components required for deploying the system.

4. What are the major three types of modeling used?

The 3 Major types of modeling are

- architectural,
- behavioral, and
- structural.

5. Name 9 modeling diagrams that are frequently used?
9 Modeling diagrams that are commonly used are

1. Use case diagram
2. Class Diagram
3. Object Diagram
4. Sequence Diagram
5. statechart Diagram
6. Collaboration Diagram
7. Activity Diagram
8. Component diagram
9. Deployment Diagram.

6. How would you define Architecture?
Architecture is not only taking care of the structural and behavioral aspect of a software system but also taking into account the software usage, functionality, performance, reuse, economic and technology constraints.

7.What is SDLC (Software Development Life Cycle)?
SDLC is a system including processes that are

- Use case driven,
- Architecture centric,
- Iterative, and
- Incremental.

UML VIVA Questions and Answers :-
8. What is the Life Cycle divided into?
This Life cycle is divided into phases.
Each Phase is a time span between two milestones.
The milestones are

- Inception,
- Elaboration,
- Construction, and
- Transition.

9. What are the Process Workflows that evolve through these phases?

The Process Workflows that evolve through these phases are

- Business Modeling,
- Requirement gathering,
- Analysis and Design,
- Implementation,
- Testing,
- Deployment.

Supporting Workflows are Configuration, change management, and Project management.

10. What are Relationships?

There are different kinds of relationships:

- Dependencies,
- Generalization, and
- Association.

Dependencies are relationships between two entities.

A change in specification of one thing may affect another thing.

Most commonly it is used to show that one class uses another class as an argument in the signature of the operation.

Generalization is relationships specified in the class subclass scenario, it is shown when one entity inherits from other.

Associations are structural relationships that are:

a room has walls,

Person works for a company.

Aggregation is a type of association where there is a has a relationship.

As in the following examples: A room has walls, or if there are two classes room and walls then the relation ship is called a association and further defined as an aggregation.

11. How are the diagrams divided?
The nine diagrams are divided into static diagrams and dynamic diagrams.

12. Static Diagrams (Also called Structural Diagram):
The following diagrams are static diagrams.

- Class diagram,
- Object diagram,
- Component Diagram,
- Deployment diagram.

13. Dynamic Diagrams (Also called Behavioral Diagrams):
The following diagrams are dynamic diagrams.

- Use Case Diagram,
- Sequence Diagram,
- Collaboration Diagram,
- Activity diagram,
- Statechart diagram.

14. What are Messages?
A message is the specification of a communication, when a message is passed that results in action that is in turn an executable statement.

15. What is an Use Case?

- A use case specifies the behavior of a system or a part of a system.
- Use cases are used to capture the behavior that need to be developed.
- It involves the interaction of actors and the system.

SOFTWARE ENGG THEORY QUESTIONS AND ANSWERS

1) What Is SDLC?

SDLC is an abbreviation of Software Development Life Cycle. SDLC is series of steps that offers a defined model for the development and lifecycle management of an application.

2) Name five Models used in SDLC

- Waterfall model
- Rapid Application Development(RAD) model
- Agile model
- Iterative model
- Spiral model

3) Explain Phases of the waterfall model

The five-main phase of waterfall model are:

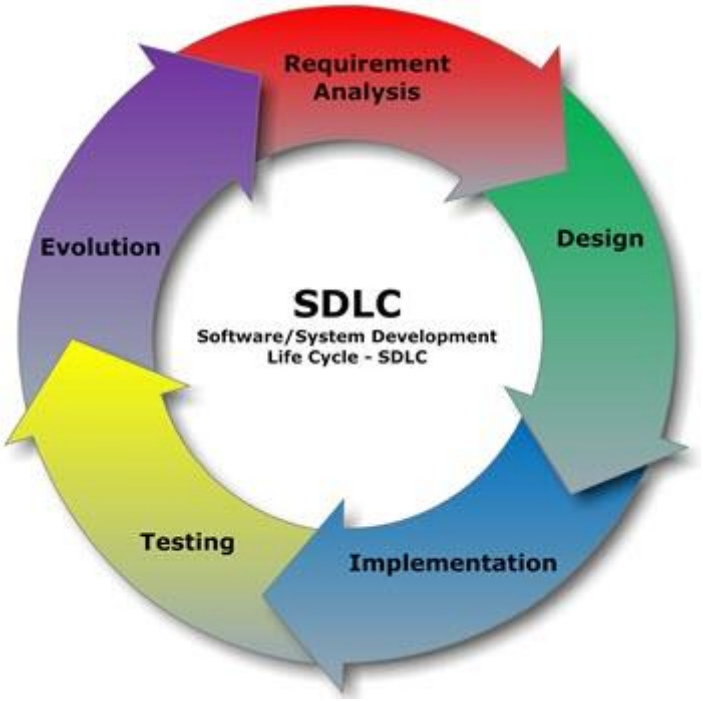
- Requirements gathering
- Design
- Development
- Testing
- Implementation & Maintenance

4) States the importance of Design phase?

The requirements is specified in the form of a document. It is then converted into a logical structure which needs to be implemented in a specific programming language. The design phase is also helpful for specifying hardware & system requirements. It also allows defining complete system architecture. The output is designed to document that acts as an input for all the subsequent SDLC phases.

5) What are the tasks performed in Coding phase?

In the coding phase, the design document is converted into an executable programming language. The output of the coding stage is the source code which can act as input for testing and maintenance phase.



6) What is feasibility study?

Feasibility allows assessing how viable software project development will be for any organization. The software analyst does the complete study to understand the operational, economic, and technical feasibility of any project.

7) What are the Maturity levels in CMM?

Capability Maturity Model is a benchmark for analyzing the maturity of an organization's software development process. It is a technique which is used to refine a company's software development process. It is using to assess any company against a scale of five different levels of levels based on their Key Process Areas. It tells about the maturity of the company based on the project the company is dealing with and the clients.

Initial, Managed, Defined, Quantitatively Managed and Optimizing are five levels which determine CMM levels of any company.

8) Give some benefits of using V model?

- Simple and easy to use.
- Each phase has specific
- V model is more successful because of the early development of test plans. This reduces the cost of bug fixes
- Works most effective with small projects where requirements are small

9) What is the 'scope' of a project?

The scope of the project is nothing but, the goals, objectives, and expectations of the project. Software scope is a well-defined boundary, which includes all the process which are performed to develop and deliver the software product. The software scope consists of all functionalities and artifacts to be delivered to the software system. The software scope also helps to identifies what the system will do and what it will not do.

10) According to you, when should users be trained on a new system?

During the implementation phase

11) Name the phase where the performance of the new system monitored?

During the Evolution and Maintenance phase, the system is continuously monitored.

12) What is a computer-based information system?

It is a system in which computers perform some procedures.

13) Explain Low Level Or Detailed Design concerning SDLC

In Low-Level Design, High-Level Design is broken down into modules and programs. Logic design is developed for every program, and it will be documented as program specifications.

14) What is the use of JAD session?

JAD (Joint Application Design) session is used to gain data and information about the system

15) State the Difference Between SDLC And Stlc

SDLC involves the complete Verification and Validation of a Project. SDLC stage requires business requirement analysis, design, Development Process, Testing Process, and Maintenance.

Whereas STLC involves only Validation.

16) Who are the people involved in the phases of Waterfall Model

The people involved in the waterfall model depend upon the structure of the organization. Here, are professionals who are generally involved

- Business analyst
- Technical Manager or Senior Developers
- Technical Lead or System Architect in Design Phase
- Developers in Coding phase.
- Testers in Testing Phase.
- Project Manager, and Maintenance Team in the Maintenance phase

17) What is level-0 DFD?

Highest abstraction level is called Level 0 DFD (Data Flow Diagram). It is also is known as context level DFD. It gives specifications about the entire information system as one diagram which has all the details about the system.

18) Explain the team Requirement Gathering concerning SDLC

Requirement Gathering is an important SDLC phase. In this stage business requirements are gathered. The schedule and cost of the project also analyse in this phase.

19) Briefly explain Testing Phase

Different testing methodologies are practiced detecting the software bugs, which happen to take birth during the previous phases. Today, there are many types o testing tools, and methodologies are available. Few firs are also building

their testing tools, which are custom made as per the need or their organizations.

20) What are problems faced in the waterfall model?

Some of the common problems face in waterfall model are

- Waterfall model is not ideal for complex projects where requirements are not clear
- It needs lots of time to complete every stage
- There are certain bugs which never rectified in this model

21) What is the details study of the existing system is called?

The detailed study of the existing system is called System analysis

22) What is the main aim of prototyping aim?

Prototyping offers mini-model of the proposed system

23) In which step of SDLC project early termination could be done?

In the SDLC process, project termination can be performed in the feasibility study phase.

24) According to you which is most creative and challenging phase of system life cycle?

The design is one of the most challenging phases of the SDLC lifecycle.

25) Name the type of feasibility where the cost saving and additional profits will exceed the investment required.

It is known as Economic Feasibility

26) Can bug fixes also include software maintenance?

Yes, bug fixes stage also includes software maintenance

27) Cost of error correction is least in which stage of SDCL life cycle?

Cost of error correction is very less at the early stage of requirement analysis.

UNIT 4 and UNIT 5

1) What are the important categories of software?

- System software
- Application software
- Embedded software
- Web Applications
- Artificial Intelligence software
- Scientific software.

2) What is the main difference between a computer program and computer software?

A computer program is a piece of programming code. It performs a well-defined task. On the other hand, the software includes programming code, documentation and user guide.

3) What is software re-engineering?

It is a process of software development which is done to improve the maintainability of a software system.

4) Describe the software development process in brief:

The software development is a life cycle is composed of the following stages:

- Requirement analysis
- Specification
- Software architecture
- Implementation
- Testing
- Documentation

- Training and support
- Maintenance

5) What are SDLC models available?

Waterfall Model, Spiral Model, Big-bag model, Iterative Model, and V- Model are some of the famous SDLC models.

6) What is verification and validation?

Verification:

Verification is a term that refers to the set of activities which ensure that software implements a specific function.

Validation:

It refers to the set of activities which ensure that software that has been built according to the need of clients.

7) In software development process what is the meaning of debugging?

Debugging is the process that results in the removal of error. It is very important part of the successful testing.

8) How can you make sure that your code is both safe and fast?

In the software, development security is always first. So if the execution of the program is slow then, I will try to identify the reason out ways to its time complexity.

9) Name two tools which are used for keeping track of software requirements?

There many l ways to keep track of requirements.

Two commonly used are:

- Make a requirements specifications document to list all of the requirements.
- Create an excel sheet the list down the requirement, type, dependency, priority, etc.

10) What is the main difference between a stubs, a mock?

A stub is a minimal implementation of an interface which generally returns hardcoded data while mock usually verifies outputs against expectations. Those expectations are set in the test.

11) What language do you like to write programming algorithms?

Every developer has their views when it comes to the programming language choices. Though, one should prefer high-level languages because they are dynamic. Like C and C++ languages.

12) What is computer software?

Computer software is a package which includes a software program, its documentation, and user guide on how to use the software.

13) According to you which SDLC model is the best?

There, is no such ranking, as SDLC Models are adopted as per the need for the development process. It may differ software-to-software.

14) Who is software project manager? What is his role?

A software project manager is a person responsible for managing the software development project.

The project manager is doing the project planning, monitoring the progress, communication. He or she also manages risks and resources to deliver the project within time, cost, and quality constraints.

15) What is mean by software scope?

Software scope is a well-defined boundary. It includes all kind of activities that are done to develop and deliver the software product.

The software scope defines all functionalities and artifacts to be delivered as a part of the software. The scope also identifies what the product will do? What is not the part of the project? What is project estimation?

This process is helpful to estimate various aspects of the software product. This estimation can be decided either consulting experts or by using pre-defined formulas.

16) How to find the size of a software product?

The size of software product can be calculated using by following two methods

- Counting the lines of delivered code
- Counting delivered function points

17) What are function points?

Function points are the features which are provided by the software product. It is considered as a most important measurement for software size.

18) What are software project estimation techniques available?

Most widely used estimation techniques are:

- Decomposition technique
- Empirical technique

19) What is Software configuration management?

Software configuration management is a process of tracking and controlling changes that happen in the software.

Change control is a function which ensures that all changes made into the software system are consistent and created using organizational rules and regulations.

20) How can you measure project execution?

We can measure project execution using Activity Monitoring, Status Reports, and Milestone Checklists.

21) Tell me about some project management tools.

There are many types of management tools used as per the need for a software project. Some of them are Pert Chart, Gantt Chart, Resource Histogram, Status Reports, etc.

22) What are software requirements?

Software requirements are a functional description of a proposed software system. It is assumed to be the description of the target system, its functionalities, and features.

23) What is feasibility study?

It is a measure to find out how practical and beneficial the software project development will prove to the organization. The software analyzer conducts a study to know the economic, technical and operational feasibility of the project.

1. **Economic:** It includes the cost of training, cost of additional and tools and overall estimation of costs and benefits of the project.
2. **Technical:** It evaluate technical aspect. Is it possible to develop this system? Assessing the suitability of machine(s) and OS on which software will execute, knowledge of the software development and tools available for this project.
3. **Operational:** Here the analyst need to assess that the organization will able to adjust smoothly to the changes done as per the demand for the project. Is the problem worth solving at the estimated cost?

After, studying all this the final feasibility report is created.

24) What are functional and non-functional requirements?

Functional requirements are functional features which are expected by users from the proposed software product.

Non-functional requirements are related to security, performance, look, and feel of the user interface.

25) What is software metric?

Software Metrics offers measures for various aspects of software process which are divided into:

1. Requirement metrics: Length requirements, completeness
2. Product metrics: Number of coding Lines, Object-oriented metrics, design and test metrics.

26) What is modularization?

Modularization is a technique which is used for dividing a software system into various discreet modules. That is expected to carry out the tasks independently.

27) What is cohesion?

Cohesion is a measure that defines the intra-dependability among the elements of the module.

28) Mentions some software analysis & design tools?

Some of the most important software analysis and designing tools are:

- Data Flow Diagrams
- Structured Charts
- Structured English
- Data Dictionary
- Hierarchical Input Process Output diagrams
- Entity Relationship Diagrams and Decision tables

29) What is mean by level-0 Data flow diagram?

Highest abstraction level is called Level 0 of DFD. It is also called context level DFD. It portrays the entire information system as one diagram.

30) What is the major difference between structured English and Pseudo Code?

Structured English is native English language. It is used to write the structure of a program module. It uses programming language keywords. On the other hand, Pseudo Code is more like to the programming language without syntax of any specific language.

31) What is structured design?

Structured design is a conceptualization of problem. It also called solution design and which is based on 'divide and conquer' strategy.

32) What is functional programming?

It is a programming method, which uses the concepts of a mathematical function. It provides means of computation as mathematical functions, which also produces results irrespective of program state.

33) What is Quality Assurance vs. Quality Control?

Quality Assurance checks if proper process is followed while developing the software while Quality Control deals with maintaining the quality of software product.

34) What are CASE tools?

CASE means Computer Aided Software Engineering. They are set of automated software application programs, which are used to support, enhance and strengthen the SDLC activities.

35) Which process model removes defects before software get into trouble?

Clean room software engineering method removes defects before software gets into trouble.

36) How do you prioritize requirements?

First, you need to design a system by evaluating data structure. Then you should move on to the code structure needed to support it.

37) What is essential for testing the quality of the code?

According to me, the unit testing framework is essential for testing the quality of the code.

38) Do you think that the maintenance of software is expensive?

maintenances of software will never be expensive if we are using proper development process.