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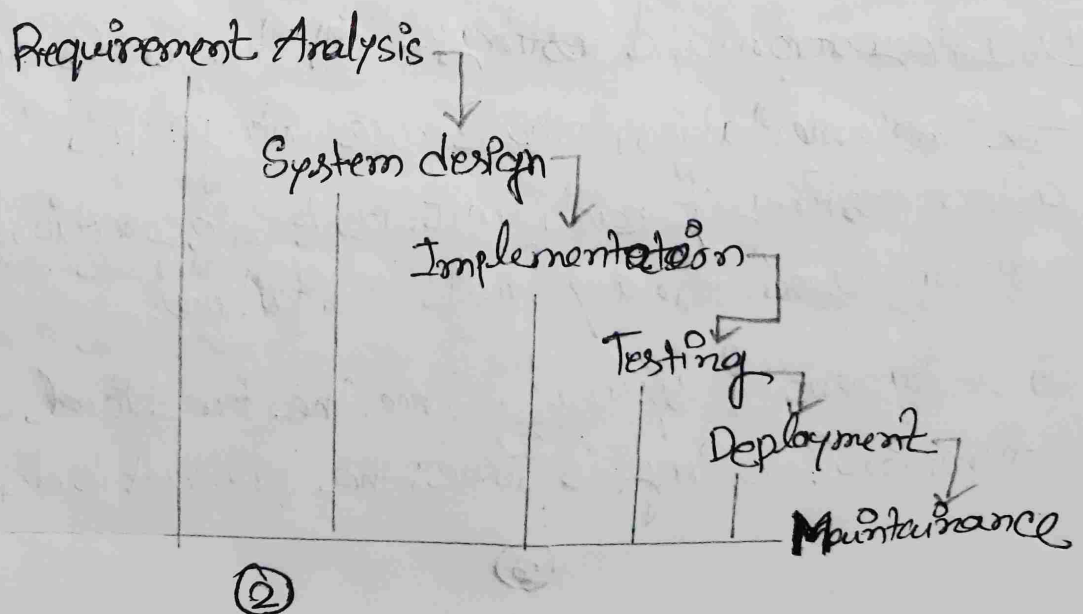
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Ans to the Q no - (1) a

Software engineering: - Software engineering is the branch of computer science that deals with the design, development, testing, and maintenance of software applications.

Ans to the Q no - (2) b

Waterfall model: - Waterfall model is the earliest SDLC approach that ~~was~~ was used for software development. In the waterfall model it illustrates the software development process in a linear sequential flow, This means that any phase in the development process begins only if the previous phase is complete.



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:- This phase studies first phase requirement specifications, preparing system design to specify hardware and system requirements, defining overall system architecture.

③ Implementation:- System design inputs are used to develop small programs called units, which are integrated in the next phase and tested for functionality through 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 tested for any faults and failures.

⑤ Deployment of system:- Once the functional and non functional testing is done; the product is deployed in

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the customer's environment or released into the market.

④ Maintenance:- Issues arise in the client environment, requiring patches and improved versions to be released, with maintenance conducted to deliver these changes in the customer's environment.

Validation process:-

Validation is often conducted after the completion of the entire software development process. It checks if the client gets the product they are expecting.

It is a one time process that ensures the software team has built the right product. It involves various validation methods, such as White Box Testing (non-functional testing) and Black Box Testing (functional testing). White Box testing compares output values against input values, while Black Box Testing uses input, output and expected variables to verify if the actual output meets expectations.

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Ans to the Q no 1(c)

A software requirement specification (SRS) is a comprehensive information/description of a product/~~service~~ system to be developed with its functional and non-functional requirements.

Characteristics of SRS:-

- ① Concise:- This will be genuine requirements which will be the part of SRS.
- ② Complete:- Software system will perform each and every functions as per the SRS.
- ③ Unambiguous;- Which means not confusing, every requirement will be specified in the SRS which will have only one meaning.
- ④ Verifiable:- This will do the cross verifying of the SRS which is understood by software.
- ⑤ Consistent;- which means stable due to the non conflicting requirements.
- ⑥ Modifiable:- If necessary changes can be made which doesn't affect the consistency and also the completeness.

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① Traceable:- origin of the requirement should be clear that the future assist verification and also validate.

Ans to the Q no 2(a)

Categories of software maintenance:-

- ① Corrective Software Maintenance:- This involves fixing errors and bugs in the software system.
- ② Patching:- It is an emergency fix implemented mainly due to pressure from management.
- ③ Adaptive Maintenance:- This involves modifying the software system to adapt it to changes in the environment, such as changes in hardware or software, government policies and business rules.
- ④ Perfective Maintenance:- This involves improving functionality, performance, and reliability, and restructuring the software system to improve changeability.
- ⑤ Preventive Maintenance:- This involves taking measures to prevent future problems, such as optimization, updating documentation, reviewing and testing the system, and
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implementing preventive measures such as backups.

Ans to the Q no-2(c)

Q Difference between black box testing and white box testing:-

Black Box testing

① It is a way of software testing in which the internal structure of the program or the code is hidden.

② Implementation of code is not needed.

③ It is mostly done by software testers.

④ No knowledge of implementation is needed.

White Box testing

① It is a way of testing where the tester has knowledge about the internal structure or the code.

② Code implementation is necessary.

③ It is mostly done by software developers.

④ Knowledge of implementation is needed.

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Black Box Testing

⑤ It's a functional test of a software.

⑥ The testing can be initiated based on the requirement specifications document.

⑦ No knowledge of programming is required.

⑧ It is applicable to the higher levels of testing of software.

⑨ It is least time consuming.

⑩ Can be done by trial and error ways and methods, etc.

White Box Testing

⑤ It's a structural test of the software.

⑥ This type of testing of software is started after a detail design document.

⑦ Mandatory to have knowledge of programming.

⑧ It is generally applicable to the lower levels of software testing.

⑨ Most time consuming.

⑩ Data domains along with inner or internal boundaries can be better tested, etc.

Ans to the Q no 2(c)

① In software quality assurance (SQA), there are various types of documents that are used throughout the software development cycle. Some of the commonly used documents in SQA include:

① Test plan: It defines the testing objectives, scope, approach, resources and schedule for a software testing effort.

② Test cases:- These are documents that specify the inputs, actions and expected results for a particular test scenario.

③ Test scripts:- These are automated test cases that are written in a scripting language like python, Java or javascript.

④ Test results: These documents ~~are~~ record the actual results of a test case or test scenarios.

⑤ Traceability matrix:- These documents help to ensure that there is a clear traceability between

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requirements and test cases.

⑥ Bug reports:- These are documents that record defects or issues found during testing.

⑦ User Manuals:- These documents provide instructions on how to use the software.

⑧ Requirements Documents:- These documents describe the functional and non-functional requirements of the software.

⑨ Design documents:- These documents describe the architecture and design of the software.

These were just a few examples of the types of documents used in SQA.

Ans to the Q no - 3(a)

④ Software project management is comprising of a number of activities, which contains planning of project, deciding scope of software product,

estimation of cost in various terms, scheduling of tasks and events, and resource management.

Ans to the Qno-3(b)

A project manager is a character who is responsible for giving decisions, both large and small projects. The project manager is used to manage the risk and minimize uncertainty. Every decision the project manager must directly profit their project.

Role of a Project Manager:-

- ① Leader:- A project manager must lead his team and should provide them direction to make them understand what is expected from all of them.
- ② Medium:- The project manager is a medium between his clients and his team. He/She must co-ordinate and transfers all the appropriate information from the clients to his team and report to the senior management.
- ③ Mentor:- He/She should be there to guide his team at each step and make sure that the team has an attachment. He/She provides a recommendation to his team and points them in the right direction.

Responsibilities of a Project Manager:-

- ① Managing risks and issues.
- ② Create the project team and assign tasks to several team members.
- ③ Activity planning and ~~re~~ sequencing.
- ④ Monitoring and reporting progress.
- ⑤ Modifies the project plan to deal with the situation.

Ans to the Q no-3(c)

Iterative model advantage and disadvantage:-

It is extremely important to know the advantages to know Iterative model:

- ① Some working functionality can be developed and early in the software development life cycle (SDLC).
- ② It is easily adaptable to the ever changing needs of the project as well as the client.
- ③ It is best suited for agile organisations.
- ④ It is more cost effective to change the scope on requirements in ~~Iter~~ Iterative model.

- ④ Parallel development can be planned.
- ④ Testing and debugging during smaller iteration is easy.
- ④ Risks are identified and resolved during iteration, and each iteration is an easily managed.
- ④ In iterative models less time is spent on documenting and more time is given for designing.
- ④ One can get reliable user feedback, when presenting sketches and blueprints of the product to users for their feedback.

~~Dis~~ Disadvantages of Iterative model:-

Even though, iterative model is extremely beneficial, there are few drawbacks and disadvantages attached to it, such as,

- ④ More resources may be required.
- ④ Although cost of change is lesser, but it is not very suitable for changing requirements.
- ④ More management attention is required.
- ④ It is not suitable for smaller projects.
- ④ Highly skilled resources are required for skill analysis.

① Project progress is highly dependent upon the risk analysis phase.

② Defining increment may require definition of the complete system.

Ans to the Q no - 4(a)

Quality is a vital part of the software creation process. It's what ensures that the final product meets all requirements.

The importance of quality:-

① Ensures a high-quality software product: Software quality assurance ensures that the software meets the specified quality standards and requirements. This results in software that is more reliable, efficient, and user-friendly.

② Saves time and money: SQA ensures that the developers find bugs and errors at the early stages of software development. Therefore, they spend a lot less time and money fixing them.

③ Building a stable and competitive software product: Software architects specifically vet each block in the software development process against industry standards. Granular testing for different requirements like reliability, functionality, usability, portability, etc., helps ~~ensure~~ ensure that their product is highly-quality.

④ Protect your company's reputation: Software quality assurance helps organizations ensure that their application is efficient, secure, and trustworthy. Most importantly, it helps them meet regulatory and industry-specific compliance requirements, such as those related to security and data privacy. If the customer finds these problems before you do it'll significantly impact your brand image and reputation.

⑤ Ensure customer satisfaction: - Your software application has to fulfill all the needs to satisfy the customers. It has to work smoothly without any malfunctions. With software quality assurance process in place, you can ensure that your product delivers everything that your audience expects.

Ans to the Q no 4(b)

SQA activities:-

- ① SQA management plan:- Make a plan for how you will carry out the sqa throughout the project. Think about which set of software engineering activities are the ~~set~~ best for project. check level of sqa team skills.
- ② Set the check points:- SQA team should set checkpoints. Evaluate the performance of the project on the basis of collected data on different check points.
- ③ Multi testing strategy:- Do not depend on a single testing approach. When you have a lot of testing approaches available use them.
- ④ Measure change impact:- The changes for making the correction of an error sometimes re. introduces more errors. Keep the measure of impact of change on project. Reset the new change to change check the compatibility of this fix with whole

project.

⑤ Manage good relations:- In the working environment managing good relations with other teams involved in the project development is mandatory. Bad relation of sqa team with programmers team will impact directly and badly on project. Don't play politics.

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