Question Bank.

Subject: Software Engineering

UNIT-1I: REQUIREMENTS ENGINEERING

1. Distinguish between functional and non-functional requirements with examples.

- ->Functional requirements
  - Statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations.
  - May state what the system should not do.
  - Describe functionality or system services.
  - Depend on the type of software, expected users and the type of system where the software is used.
  - Functional user requirements may be high-level statements of what the system should do.
  - Functional system requirements should describe the system services in detail.

- Non-functional requirements
  - Constraints on the services or functions offered by the system such as timing constraints, constraints on the development process, standards, etc.
  - Often apply to the system as a whole rather than individual features or services.
  - These define system properties and constraints e.g. reliability, response time and storage requirements. Constraints are I/O device capability, system representations, etc.
  - Process requirements may also be specified mandating a particular IDE, programming language or development method.
  - Non-functional requirements may be more critical than functional requirements. If these are not met, the system may be useless.
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2. Explain the types of non-functional requirements with examples.

https://www.guru99.com/non-functional-requirement-type-example.html#:~:text=A%20non%2Dfunctional%20requirement%20defines,to%20update%20their%20salary%20information.

3. List and explain at least 03 functional and 02 Non-functional requirements for Vehicle Toll collection system using Fastag software.
4. Identify any 5 Functional and Non functional requirement for bank and Library System?

Functional requirements

-user id is provided when they register

-The system must only allow user with valid id and password to enter the system

-The system performs authorization process which decides what user level can acess to.

-The user must be able to logout after they finished using system.

-System must be able to verify information

-System must be able to enter number of copies into table.

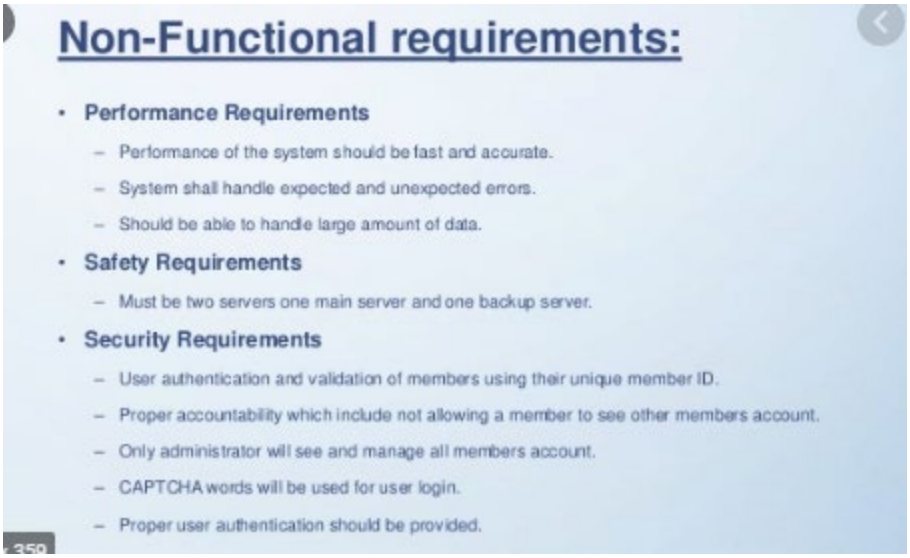
- System must be able to not allow two books having same book id.

-System must be able to enter issue information in database.

-System must be able to update number of books.

- System must be able to search if book is available or not before issuing books

-System should be able to enter issue and return date information



5. What are the different metrics for specifying non-functional requirements?

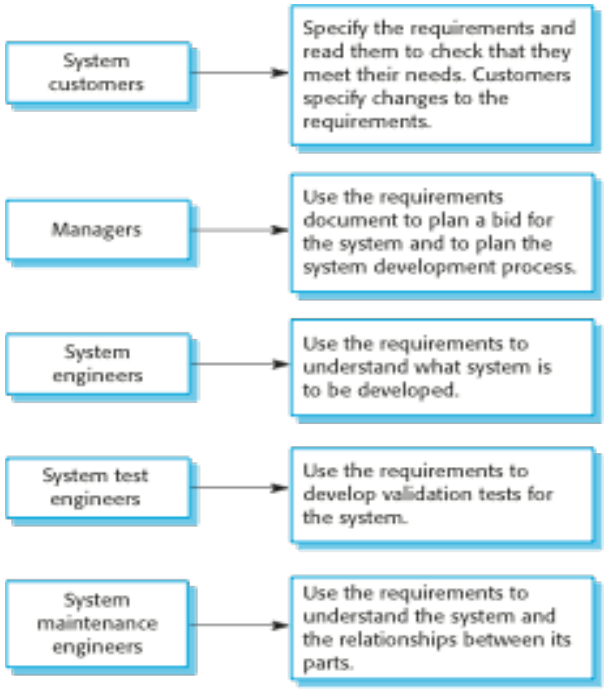
Speed	Processed transactions/second User/event response time Screen refresh time
Size	Mbytes Number of ROM chips
Ease of use	Training time Number of help frames
Reliability	Mean time to failure Probability of unavailability Rate of failure occurrence Availability
Robustness	Time to restart after failure Percentage of events causing failure Probability of data corruption on failure
Portability	Percentage of target dependent statemen Number of target systems

6. What is software requirements document, and who are the users of requirements document?

The software requirements document is the official statement of what is required of the system developers.

Should include both a definition of user requirements and a specification of the system requirements.

It is NOT a design document. As far as possible, it should set of WHAT the system should do rather than HOW it should do it



7. Explain in brief the structure of a requirements document that is based on an IEEE standard for requirements documents?

Chapter	Description
Preface	This should define the expected readership of the document and describe its version history, including a rationale for the creation of a new version and a summary of the changes made in each version.
Introduction	This should describe the need for the system. It should briefly describe the system's functions and explain how it will work with other systems. It should also describe how the system fits into the overall business or strategic objectives of the organization commissioning the software.
Glossary	This should define the technical terms used in the document. You should not make assumptions about the experience or expertise of the reader.
User requirements definition	Here, you describe the services provided for the user. The nonfunctional system requirements should also be described in this section. This description may use natural language, diagrams, or other notations that are understandable to customers. Product and process standards that must be followed should be specified.
System architecture	This chapter should present a high-level overview of the anticipated system architecture, showing the distribution of functions across system modules. Architectural components that are reused should be highlighted.

Chapter	Description
System requirements specification	This should describe the functional and nonfunctional requirements in more detail. If necessary, further detail may also be added to the nonfunctional requirements. Interfaces to other systems may be defined.
System models	This might include graphical system models showing the relationships between the system components and the system and its environment. Examples of possible models are object models, data-flow models, or semantic data models.
System evolution	This should describe the fundamental assumptions on which the system is based, and any anticipated changes due to hardware evolution, changing user needs, and so on. This section is useful for system designers as it may help them avoid design decisions that would constrain likely future changes to the system.
Appendices	These should provide detailed, specific information that is related to the application being developed; for example, hardware and database descriptions. Hardware requirements define the minimal and optimal configurations for the system. Database requirements define the logical organization of the data used by the system and the relationships between data.
Index	Several indexes to the document may be included. As well as a normal alphabetic index, there may be an index of diagrams, an index of functions, and so on.

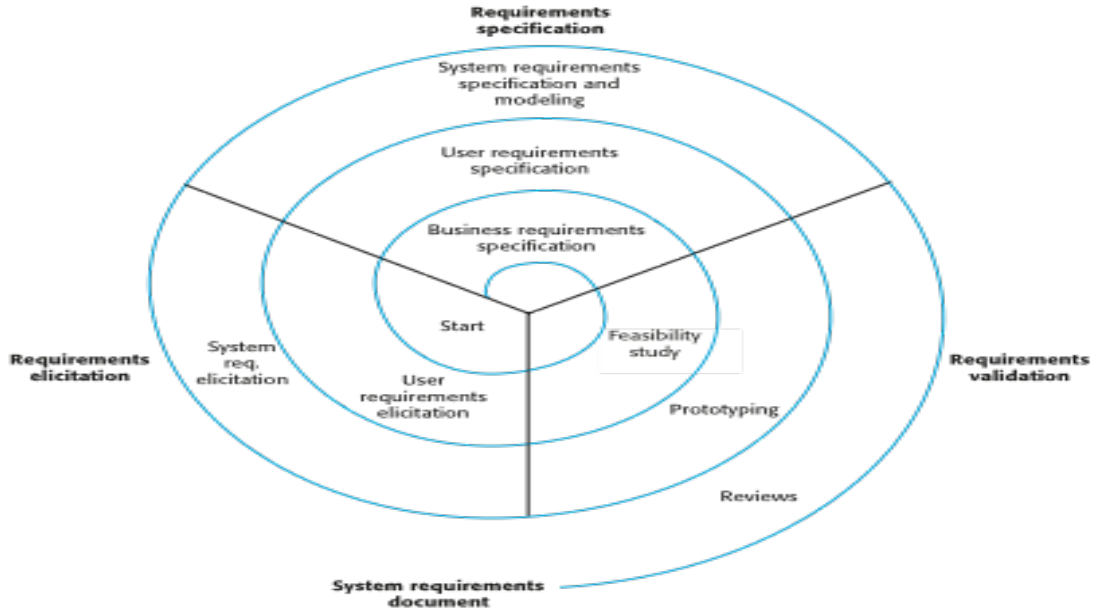
8. Reliance industries is planning to start a cinema multiplexes across India. You have been asked to develop a Film ticket reservation system for their multiplexes online. List the system requirements using structured specification format for the same.
   https://www.process.st/checklist/online-movie-ticket-booking-system/

9. What is Requirements specification? What possible reasons where all the design information cannot be implemented?

-> he production of the requirements stage of the software development process is **Software Requirements Specifications (SRS)** (also called a **requirements document**). This report lays a foundation for software engineering activities and is constructing when entire requirements are elicited and analyzed. **SRS** is a formal report, which acts as a representation of software that enables the customers to review whether it (SRS) is according to their requirements. Also, it comprises user requirements for a system as well as detailed specifications of the system requirements.

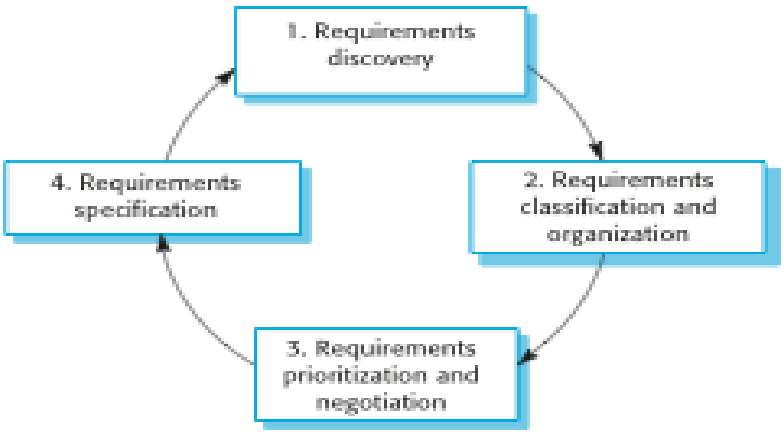
10. What are the different ways of writing system requirements specification?
11. Explain in details the requirements engineering processes with an appropriate diagram?

- -> The processes used for RE vary widely depending on the application domain, the people involved and the organisation developing the requirements.
- However, there are a number of generic activities common to all processes
  - Requirements elicitation;
  - Requirements analysis;
  - Requirements validation;
  - Requirements management.
- In practice, RE is an iterative activity in which these processes are interleaved.



12. Explain with a neat diagram the different steps in the requirements elicitation and analysis process?

- -> Software engineers work with a range of system stakeholders to find out about the application domain, the services that the system should provide, the required system performance, hardware constraints, other systems, etc.
- Stages include:
  - Requirements discovery,
  - Requirements classification and organization,
  - Requirements prioritization and negotiation,
  - Requirements specification.



- Requirements discovery
  - Interacting with stakeholders to discover their requirements. Domain requirements are also discovered at this stage.
- Requirements classification and organisation

  - Groups related requirements and organises them into coherent clusters.

- Prioritisation and negotiation
  - Prioritising requirements and resolving requirements conflicts.
- Requirements specification
  - Requirements are documented and input into the next round of the spiral.

13. What are the various reasons where Eliciting and understanding requirements process is difficult for stakeholders?

- -> Stakeholders don't know what they really want.
- Stakeholders express requirements in their own terms.
- Different stakeholders may have conflicting requirements.
- Organisational and political factors may influence the system requirements.
- The requirements change during the analysis process. New stakeholders may emerge and the business environment change.