Question 1 – Audits - 3 Marks

5 Quarterly Audits are planned Q1 , Q2, Q3, Q4, Q5 for this Project

What is your knowledge on how these Audits will happen for a BA ?

Performing a software audit on a business analyst typically involves reviewing the tools they use, ensuring compliance with licensing agreements, assessing data security measures, and evaluating the effectiveness of their software in meeting business objectives

1. Tool Usage Review: Examine the software tools used by the business analyst for requirements gathering, analysis, documentation, and communication. This includes tools like Microsoft Visio, Lucidchart, Jira, Confluence, or specialized tools for business process modeling.
2. Licensing Compliance: Verify that all software used by the business analyst is properly licensed. Check the number of licenses purchased against the number of users, ensuring compliance with vendor agreements and avoiding any legal issues related to software piracy.
3. Data Security Assessment: Evaluate the security measures in place for handling sensitive business data within the software tools. This involves assessing encryption protocols, access controls, user permissions, and data storage practices to mitigate the risk of unauthorized access or data breaches.
4. Integration Capability: Assess whether the software tools used by the business analyst integrate seamlessly with other systems and applications within the organization's IT infrastructure. Compatibility with existing software solutions is crucial for efficient data exchange and workflow automation.
5. Effectiveness Evaluation: Determine how effectively the software tools support the business analyst's tasks and objectives. This includes evaluating features such as ease of use, customization options, reporting capabilities, and scalability to accommodate evolving business needs.
6. User Training and Support: Review the availability of training resources and technical support for the software tools used by the business analyst. Adequate training ensures that users can maximize the potential of the software, while responsive support services help troubleshoot any issues that may arise during usage.
7. Cost Analysis: Analyze the total cost of ownership (TCO) associated with the software tools, considering not only the initial purchase or subscription fees but

also ongoing maintenance, upgrades, and support costs. Assess whether the benefits derived from the software justify the investment.

8. Compliance with Industry Standards: Ensure that the software tools align with relevant industry standards and best practices for business analysis, such as those defined by the International Institute of Business Analysis (IIBA) or the Project Management Institute (PMI).
9. Feedback Collection: Gather feedback from the business analyst and other stakeholders regarding their experience with the software tools. Identify any pain points, usability issues, or feature requests that could inform future improvements or adjustments to the software environment.

By conducting a comprehensive software audit along these lines, organizations can ensure that their business analysts have access to the right tools and resources to effectively perform their roles while maintaining compliance, security, and efficiency standards.

Quarterly 1 Audit Report

Farmer Friend System Audit Report from January 2023 to April 2023

Report Number 1

Date:1.5.2023

Requirements gathering,Tool Usage Review

Objective:
To assess the usage of software tools by business analysts for requirements gathering, analysis, and documentation, and to identify opportunities for improvement.

Areas of Audit	**Findings and Observation**	**Recommendation**
Requirements gathering and Frequently used tools list	BRD, Elicitation result report documents, Duplicate requirements report, Grouping functionality requirements, Client sign off document, Email	Documents are complete and comprehensive.Explore the possibility of implementing additional software tools or modules to address specific analysis needs.

	communication.The most commonly used tools among business analysts include Microsoft Visio, Jira, and Confluence.	
Efficiency of document and tools	BRD, Elicitation result report, Grouping functionality requirements While these tools are effective for requirements documentation and project management, there is a need for additional tools to support specialized analysis tasks.	Documents are put in a comprehensive manner.Investigate integration options to streamline workflow and enhance collaboration between different toolsets.
Business analyst feedback	Feedback from business analysts indicates a desire for more integration between tools and enhanced collaboration features.	Provide training and support to ensure business analysts can effectively utilize the full capabilities of the existing toolset.

Quarterly 2 Audit Report

Farmer Friend System Audit Report from May 2023 to August 2023

Report Number 2

Date:10.9.2023

Quarter 2: Requirements analysis and Licensing Compliance

Objective:

To ensure all the requirements are analysed and documented and ensure compliance with software licensing agreements and mitigate the risk of non-compliance.

Areas of Audit	**Findings and Observation**	**Recommendation**

UML,RTM, Business to functional requirements mapping, Client sign off document,License verification	All the documents are complete and well maintained All software licenses are up to date, and the number of licenses purchased aligns with the number of users.	Documents are complete but lack of details Continue to conduct regular audits to ensure ongoing compliance with software licensing agreements.
Requirements traceability matrix Unlicensed software list	Requirements traceability matrix are traced to goal but not developed to test cases. No instances of unlicensed software usage were identified during the audit.	Can affect test quality so need to be considered.Implement processes for tracking software usage and license renewals to prevent any lapses in compliance.

Quarterly 3 Audit Report

Farmer Friend System Audit Report from September 2023 to December 2023

Report Number 3

Date:5.1.2024

Quarter 3: Design phase and Data Security Assessment

Objective:

To evaluate the BA contribution to design phase , alignment with goal and requirements,effectiveness of data security measures implemented within software tools used by business analysts.

Areas of Audit	**Findings and Observation**	**Recommendation**
Tools utilisation,Data storage	Visio,Balsmiq,Axure,Encryption protocols, access controls, and data storage practices meet industry standards for data security.	Continue to monitor emerging threats and vulnerabilities and update security measures accordingly.

Documented evidence on client communication , stalkholders review and approval,Vulnerability in security	Document are clear and structured, conducted walkthrough and feedback captured.No significant vulnerabilities or gaps in security measures were identified during the assessment.	Implement regular security awareness training for business analysts to promote best practices for data protection.
BA and stalkholders collaboration,Security verification	Limited clarification session and post hand overRegular security updates and patches are applied to mitigate emerging threats and vulnerabilities.	May delay developmentConduct periodic penetration testing and vulnerability assessments to proactively identify and address any security weaknesses.

Quarterly 4 Audit Report

Farmer Friend System Audit Report from January 2024 to April 2024

Report Number 4

Date:8.5.2024

Quarter 4: Development phase and Integration Capability

Objective:

To assess the development phase how business analyst support the team and the project integration capabilities of software tools used by business analysts with other systems and applications.

Areas of Audit	**Findings and Observation**	**Recommendation**
Requirements clarification,JAD Integration capabilities	Timely clarification provided but took time for complex details Software tools demonstrate strong	Explore additional integration options to further optimize workflow automation and data exchange.

	integration capabilities with existing IT infrastructure.	
End user manual BA and development team collaboration RTM,Data flow	RTM updated,BA participated in stand ups and provide support,End user manual updated and maintain in comprehensive manner,Data exchange between different software solutions is seamless, facilitating efficient workflow automation.	Collaborate with IT teams to identify potential integration points and prioritize integration initiatives based on business impact.
Opportunity for integration	Opportunities for further integration exist to streamline processes and enhance collaboration between different teams.	Provide training and support to ensure business analysts can effectively utilize integrated software solutions.

Quarterly 5 Audit Report

Farmer Friend System Audit Report from May 2024 to June 2024

Report Number 5

Date:3.7.2024

Quarter 5: Test phase and Effectiveness Evaluation

Objective:

Evaluating BA part in testing phase ensure that requirements are met, support the testing team and To conduct a comprehensive evaluation of the effectiveness of software tools in supporting the business analysis process.

Areas of Audit	**Findings and Observation**	**Recommendation**

Test case review , clarification support and Efficiency of software tools	BA review the test cases and core flows,promt response during testing about business logic queries and Software tools effectively support requirements gathering, analysis, and documentation tasks performed by business analysts.	Prioritize enhancements based on feedback from business analysts and stakeholders.
Requirements coverage , defect management and Tools review	RTM links to the test cases,BA helped in prioritize the defect and help in clarification,User satisfaction with the current toolset is generally high, with positive feedback on ease of use and functionality.	Work closely with software vendors to explore customization options and additional features to meet specific business needs.
UAT,End user manual and Areas of improvement	End user manual is updated and completed,UAT plans and execution are completeed,Areas for improvement include enhancing reporting capabilities and providing advanced analytics features.	Provide ongoing training and support to ensure business analysts can leverage the full capabilities of the plan and software tools effectively.

Conclusion:

The quarterly software audits have provided valuable insights into the usage, compliance, security, integration, and effectiveness of software tools used by business analysts. By implementing the recommendations outlined in this report, we can continue to optimize the software environment to support business analysis processes effectively and efficiently. Regular monitoring and evaluation will be essential to ensure ongoing compliance, security, and alignment with evolving business requirements.

What Is A Software Audit And Why Is It Performed?

A software audit is an independent review of software products, processes, and systems. The purpose of a software audit is to ensure that software development practices and products meet industry standards and organizational requirements. A software audit can help identify issues such as security vulnerabilities, non-compliance with licensing agreements, and performance problems.

Software audits are usually performed by internal or external auditors who are experts in the software development process. They examine the software development life cycle (SDLC) to ensure that it is followed correctly and that the software product meets the requirements of the business and its stakeholders. The goal of a software audit is to identify areas of improvement and to provide recommendations for enhancing the quality and effectiveness of the software product.

There are two primary methods for conducting such analysis:

> **Internal auditing** is performed on a regular basis by the in-house team and is generally more frequent.
> **External audits** are often performed by a third party with the goal of obtaining an unbiased report, particularly if the software must comply with specific policies, licenses, and legislative regulations. In addition, if the in-house staff lacks the necessary expertise, an external audit of software can be requested.

When Should Conduct A Software Audit?

Every software product requires regular internal comprehensive audits in order to remain secure, up-to-date, and growing. A software audit can be conducted at any stage of the SDLC. However, it is best to conduct an audit when the software is in its

development or testing phase. This is because it is easier to identify and fix issues early in the SDLC, rather than after the software has been released.

Additionally, it can also be conducted when there is a change in the business requirements, regulatory environment, or technology landscape. These changes can affect the software product, and a software audit can help identify any gaps or weaknesses in the product.

As a result of the examination, software owners gain a better understanding of the flaws that must be addressed, whether it means replacing a few features or updating the entire platform.

What things Needs To be considered before Auditing Software?

Before conducting a software audit, it is important to consider the scope of the audit, the audit team, and the audit objectives. The scope of the audit should be defined clearly to ensure that all relevant areas are covered. The audit team should be comprised of experts in software development and auditing. The audit objectives should be clearly defined and aligned with the business goals.

It is also important to consider the audit methodology, tools, and techniques to be used in the audit. The audit methodology should be consistent with industry standards and best practices. The tools and techniques used in the audit should be appropriate for the software product and the audit objectives.

How to prepare for a Software Audit as a Client

If the customer is sufficiently prepared for the software audit, it speeds up the process and saves money. The general software audit checklist for a customer to be prepared for an audit is discussed below:

Determining the scope of the Software Audit

The audit always revolves around some goals that the customer wants to accomplish. Therefore, it is important to identify these goals and ultimately set the scope of the audit. As discussed earlier, some audits will focus only on the quality aspects, while some can study the usability of software, it is important to identify what has to be accomplished by the audit.

Gaining an understanding of the Software Audit Process

Having some understanding of the audit process helps the customer in being helpful in case of an external audit and can save a lot of time. If a third-party software audit partner agency is performing the audit, there is no need to spend too much time on it, but a rough idea of what happens in an audit would be very helpful.

Communicate with Software Vendors

Some proprietary software products are purchased from software vendors. Maintaining good communication with a software vendor will be very helpful in case of an audit. If you keep in touch with your software vendor, there will be a higher chance that they will support you swiftly whenever you need it.

Proof of Licenses

The auditors will need to check the proof of ownership of any licenses that are being used by the software. It is important to ensure that you have proper licenses from your software publisher that allow you to use the tools required by your software.

Using a Software Asset Management tool

Software Asset Management (SAM) tools are digital asset management in a company. They are very useful in managing software licenses, tracking inadequate use of these licenses, and detecting unused licenses. If a company uses a SAM and keeps track of all its software

licenses, it makes largely facilitates the audits. Sometimes it is a good idea to hire a third-party software asset management consultant to do this for you.

Performing Internal Audits

Audits are performed internally to make a company ready for external audits and can also save costs. These audits should be regularly performed and should be considered an integral process. Preventative maintenance will save resources, whereas reactive fines will consume a significant percentage of your budget.

What should be included in the delivered Software Audit Result?

The main deliverable of a software audit is the audit report which is a summary of the audit processes and includes the identified problems and their suggested solutions by the auditors. The audit report may talk about several action items, including unused software tools which should be deleted, technical problems that need fixes, potential security vulnerabilities, outdated tools, suggestions to purchase new licenses, suggested software vendors, and plans for the next audit. The report should provide a summary of the audit scope, objectives, and methodology. It should also include a detailed analysis of the findings and recommendations for improvement.

The report should be easy to understand and should provide actionable recommendations. It should also include a prioritized list of recommendations, based on their importance and impact on the software product.

The auditors may also do an audit review meeting with the customers to discuss the audit report. In this meeting, the audit report's findings and any potential issues are discussed. The organization receives the auditors' findings indicating areas that need changes. The company can meet with the software vendors to discuss how it will fix any mistakes.

Benefits of Performing Software Audits

There are numerous benefits of performing software audits. Some of the important ones will be discussed below:

Maintaining Software Quality

Software audits help maintain software quality and also for finding areas for improvement. It enables you to keep all of the applications operating properly. Software and applications are often upgraded and updated. Every new edition includes beneficial changes, such as cybersecurity-related ones.Some of the problems in the software are identified, and after the analysis, it might become evident that some modules might need to be changed or even completely replaced. Furthermore, the usage of some tools might be increased or restricted based on what you learn from an audit. The audit might make it clear the need to purchase some new tools which further improve the quality of the software.

Maximizing license use and getting rid of unwanted licenses

During an audit, the state of current licenses can be identified, and they can be better utilized for better software usage.The audit will also check whether the licenses are up to date or not. Having up-to-date licenses will also maximize the benefits that can be obtained. Furthermore, there can be some inactive licenses,the audit team can identify these licenses and remove them accordingly.

Improving Business Operations

Whenever the software requires some proprietary tools to function properly, it is worth performing a thorough analysis to check whether the tools that are about to be purchased will be compatible with all the others currently present. Doing an audit at the right stage will ensure to purchase of compatible tools that go well with the business goals, thus enhancing the business operations.

Fulfilling Legal and Industry Requirements

During the audit, it can be analyzed whether the software complies with the IEEE standards, and in case of any non-compliance, the audit can suggest changes that will improve the software. Apart from these standards, the software is also analyzed for legal and regulatory compliance, which ensures that the software is fulfilling all the legal requirements and it is very beneficial in the long run.

Conclusion

In conclusion, a software audit is an essential part of software development.Software audits are a close inspection of software to find various problems. They can be performed internally or by an external organization. An internal audit can help keep things on track. In contrast, an external audit provides an unbiased observation of the software and dives into usually unexplored areas, such as performing a compliance audit, ensuring industry standards, and checking for legal issues.

There are many benefits to performing software audits, the biggest is saving money. After a thorough software audit is performed and the action items are addressed,the software will be of higher quality, more secure, and more compliant with industry and legal requirements.

Question 2 – BA Approach Strategy - 5 Marks

Before the Project is going to Kick Start, The Committee asked Mr Karthik to submit BA Approach Strategy

Write BA Approach strategy (As a business analyst, what are the steps that you would need to follow to complete a project – What Elicitation Techniques to apply, how to do

Stakeholder Analysis RACI/ILS, What Documents to Write, What process to follow to Sign off on the Documents, How to take Approvals from the Client, What Communication Channels to establish n implement, How to Handle Change Requests, How to update the progress of the project to the Stakeholders, How to take signoff on the UAT- Client Project Acceptance Form)

BA Approach Strategy

Project background

The domain of this project is agriculture

PESTLE Analysis for this project are

Political Factor - Government policies and regulations for online shopping,tax regulations

Economical Factors - Economy fluctuation will affect the customer spending habit

Social Factors - It influence customer online shopping behavior

Technology Factor - Network infrastructure,technology advancement will affect the customers shopping experience

Legal Factors - Data protection,copyrights,customer protection regulations

Environmental Factors - Packaging and shipping practices

Elicitation techniques

Prototyping,Brainstorming,Focus group and Interview

Stakeholder Analysis

Identify stakeholders by listing down the people affected by the project and determine stakeholders significances based on influence, power and involvement. Understand the stakeholder expectation by elicitation techniques and document the requirement. Evaluate the stakeholder based on influence and role in project then document the stakeholder analysis using RACI matrix

Documents

Business plan,business case document,business requirement document,functional requirement document,usecase document,requirement traceability matrix

Sign - off

Once BA finish documents like BRD FRD will review it with the stakeholders and send ia formal request to all the stakeholders for stakeholder approval. After approval all the stakeholders will sign off all the document

Client approval

Document and understand all the client needs and requiremen and propose solution and its process by using visual aids such as usecase,activity diagrams to client.After getting clients feedback on propose solution,send a formal approval request. Once approvel obtained prepare sign off document and save it as a record for future reference for clarity on clients approval on proposed solution

Communication Channels

Email is a primary communication channel for sending formal updates, documents, meeting invitations, and requests for feedback. project management tools such as Asana, Trello, or Jira to manage tasks, track progress, and facilitate communication

among team members.collaboration platforms like Microsoft Teams, Slack, or Zoom to facilitate real-time communication, instant messaging, video conferencing, and virtual meetings. document sharing platforms such as Google Drive, Microsoft SharePoint, or Dropbox to store, share, and collaborate on project documents, requirements, and deliverables. weekly status reports summarizing project progress, achievements, upcoming tasks, risks, and issues. stakeholder workshops or focus groups to gather requirements, elicit feedback, and facilitate consensus-building.

Handle Change Requests

As a BA once I have a clear understanding of the change, I document it appropriately, including the updated requirements, impact analysis, and any associated risks and I will convey this to Change Control Board to discuss and get approval for change request

How to update the progress of the project to the Stakeholders

By using communication channels for updating stakeholders like email updates, status reports, presentations, meetings, collaboration tools, project management software, or a combination of these channels.Updating could be weekly, bi-weekly, monthly, or at key project milestones, depending on the project's complexity and timeline.RTM will include updates on completed tasks, milestones achieved, issues encountered, risks identified, and any changes to the project plan and shared to stakeholders.Follow up with stakeholders after providing progress updates to address any additional questions or concerns they may have. Keep the lines of communication open and be responsive to stakeholder needs throughout the project lifecycle.

Question 3 – 3-Tier Architecture - 1 Marks

Explain and illustrate 3-tier architecture?

3-Tier Architecture

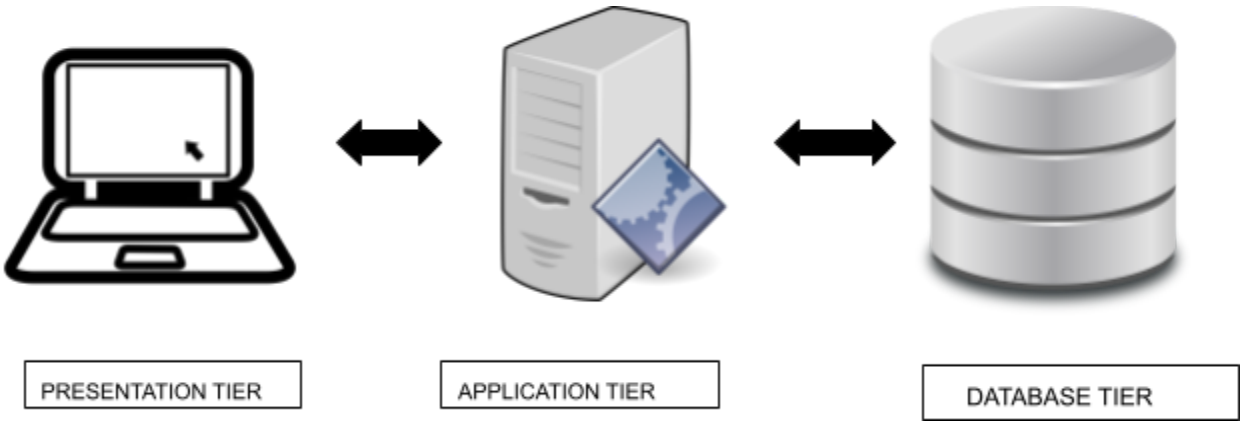
The 3-Tier Architecture, also known as the three-layer architecture, is a client-server software architecture that separates an application into three distinct layers, or tiers. Three-tier architecture is a well-established software application architecture that organizes applications into three logical and physical computing tiers:presentation tier, an application tier and a data tier.The data tier stores information, the application tier handles logic and the presentation tier is a graphical user interface (GUI) that communicates with the other two tiers.

The chief benefit of three-tier architecture is that because each tier runs on its own infrastructure, each tier can be developed simultaneously by a separate development team, and can be updated or scaled as needed without impacting the other tiers.In a three-tier application, all communication goes through the application tier. The presentation tier and the data tier cannot communicate directly with one another.
The purpose of this architecture is to improve modularity, maintainability, scalability, reliability and flexibility of the software system.

1. **Presentation Tier**:The presentation tier is the user interface and communication layer of the application, where the end user interacts with the application. Its main purpose is to display information to and collect information from the user. This top-level tier can run on a web browser, as desktop application, or a graphical user interface (GUI), for example. Web presentation tiers are usually developed using HTML, CSS and JavaScript. Desktop applications can be written in a variety of languages depending on the platform.
2. **Application Tier**: The application tier, also known as the logic tier or middle tier, is the heart of the application. In this tier, information collected in the presentation tier is processed - sometimes against other information in the data tier - using business logic, a specific set of business rules. The application tier can also add, delete or modify data in the data tier. The application tier is typically developed

using Python, Java, Perl, PHP or Ruby, and communicates with the data tier using API calls.

3. **Data Tier**: The data tier, sometimes called database tier, data access tier or back-end, is where the information processed by the application is stored and managed. Popular database systems for managing read/write access include MySQL, PostgreSQL, Microsoft SQL Server and MongoDB.



Question 4 – BA Approach Strategy for Framing Questions - 3 Marks

Business Analyst should keep what points in his/her mind before he frames a Question to ask to the Stakeholder

(5W 1H – SMART – RACI – 3 Tier Architecture – Use Cases, Use case Specs, Activity Diagrams, Models, and Page designs)

I used 5W1H,SMART,RACI and 3 Tire architecture because 5w1h helps to get clear and complete requirements and Smart makes the requirements achievable to increase the project success rate,Raci make sure all the stalkholders expectations and requirements are addressed and their roles and responsibilities in the project are clear,3 tire architecture helps to get requirements for design the software

5W1H

The 5W1H is a questioning approach and a problem-solving method that answers all the basic elements within a problem which are what, who, when, where, why, and how. It aims to view ideas from various perspectives and gain n an in-depth understanding of a specific situation. This method is commonly utilized as a continuous process-improvement technique in an organization.

What

The *what* element should clearly describe the situation, the specific problem, or basically explain the purpose of the method usage. If possible, it should also state the overall goal for implementing the solution that would be identified.

Who

Who refers to the specific people or group relevant to the issue or the situation. It should include the person who discovered the problem, who can possibly solve it, and who will be responsible for implementing the possible solution.

Where

The *where* element should contain the exact location or position of the recognized issue.It can be a place, facility, or even a certain process where the solution is to be implemented.

When

When should include all the components of the situation pertaining to anything related to dates. It should state the timeline, deadline, duration, or any other details that could help in the resolution of the problem.

Why

Although each of them are vital in achieving an effective questioning approach, the *why* is probably one of the most important elements of the 5W1H method. It explains in detail the reason and objectives behind the need for action or why there's a need to do the 5W1H method in the first place. This last *W* is also often asked five times to discover the root cause of the situation and to prevent it from recurring. This approach is called the 5 Whys analysis.

How

How, as the last element of the method, specifies the steps on how the identified plan/s should be carried out. It should also include all the resources, tools, methods, means, and even the expenditure needed for the endeavor to be effective.
To summarize, asking these questions enables those who will use the 5W1H method to get to the bottom of things by systematically structuring thoughts and emphasizing important information. Consequently, this can help recognize potential issues and possible solutions related to the scenario.

The 5W1H method is popular, simple and easy to use. It may be used in various situations. Here are a few examples.

1. To define your project

Before starting a project, it helps to be organised and above all, to know all the details of the project.
This questioning method is a useful tool to define all the aspects of a project before starting.

- What?: What is the project? What are the objectives?
- Who?: Who is the client? Who are the users? Who are the members of the team ?
- Where?: Where will the project take place?
- When?: What is the date of the consignment? When will it start? How long will it last?
- How:? Which financial, HR and technical means have been put in place to create the project? By what means will you progress?

- How many?: What budget do you have at your disposal? What are the delays in the realisation?
- Why: Why has the project been started? What are the reasons? What is the goal?

2. To solve a problem

The 5W1H method is an irreplaceable problem resolution tool because this allows you to understand a potentially problematic situation by asking the right questions.

- What: description of the problem;
- Who: the responsible parties;
- Where: the location of the problem;
- When: temporal characteristics of the problem (at what point in time, how often)
- How: the effects of the problem?
- Why: reasons, cause of the problems?

The three-tier architecture

The three-tier architecture is the most popular implementation of a multi-tier architecture and consists of a single presentation tier, logic tier, and data tier. The following illustration shows an example of a simple, generic three-tier application.

1. Application Tier: Also known as the user interface (UI) tier, this layer is responsible for presenting information to users and collecting user input. It includes components such as web pages, mobile apps, or desktop interfaces. In a business analysis context, the presentation tier focuses on understanding user requirements, designing intuitive interfaces, and ensuring that user needs are met effectively.
2. Business Logic Tier: The business logic tier, also called the application tier or middle tier, contains the core logic and processing rules of the application. It

handles tasks such as data validation, business rules enforcement, and workflow management. Business analysts collaborate closely with stakeholders to analyze business processes, identify requirements, and translate them into functional specifications for developers to implement in this tier.

3. Data Tier: The data tier, also referred to as the backend or data access layer, is responsible for managing and storing data used by the application. It includes databases, data warehouses, and other data storage mechanisms. Business analysts working on a 3-tier application analyze data requirements, define data models, and ensure that the application interacts with data sources efficiently and securely.

Application layer questions can be

How many longins are required ?
How many user will be using the system?
How many user will currently use the application?
Home page feature and functionalities ?
Business rules ?
Business requirements?
Availability ?
Reliability ?

Business logic layer questions can be

Reusable component
Frequently changing component
Governing body rules and regulation complaince
Third-party plug-ins like payments gateways mail servers printer

Database layer

Database component

RACI matrix

A RACI matrix is a document that clarifies which individuals or groups are responsible for a project's successful completion, and the roles that each will play throughout the project. The acronym RACI stands for the different responsibility types: Responsible, Accountable, Consulted, and Informed.

Responsible (R): This is the person or people who are responsible for completing a specific task or activity. They are the "doers" who are accountable for the execution of the task.

Accountable (A): This is the person who ultimately owns the task or decision. They have the authority to make final decisions and are ultimately answerable for the outcome. There should only be one person accountable for each task or decision.

Consulted (C): These are the individuals or stakeholders who need to provide input or expertise before a decision is made or a task is completed. They are consulted for their insights and expertise but are not ultimately responsible or accountable.

Informed (I): These are the individuals or stakeholders who need to be kept informed about the progress or outcome of a task or decision. They are not directly involved in the execution but need to be aware of what's happening.

In business analysis, a RACI matrix helps ensure that everyone involved in a project or process understands their role and responsibilities, minimizes confusion, prevents duplication of effort, and improves communication and accountability. It's a valuable tool for promoting efficiency and clarity in project management and business analysis activities.

Use case diagram

A use case is a methodology used in system analysis to identify, clarify and organize system requirements. The use case is made up of a set of possible sequences of interactions between systems and users in a particular environment and related to a particular goal.

1. Actor: An actor is someone or something that interacts with the system. It could be a person, another system, or even a device.
2. Use Case: A use case represents a particular functionality or task that the system needs to perform to meet the needs of the actor.
3. Description: A description of the steps involved in achieving the specific goal or task outlined in the use case.
4. Preconditions: Preconditions are the conditions that must be met before the use case can be executed.
5. Postconditions: Postconditions describe the state of the system after the use case has been executed successfully.
6. Extensions: Extensions represent alternative paths or scenarios that may occur during the execution of the use case.

BA can use a use case diagram to communicate the system vision and scope to the stakeholders, as well as to provide an overview of the system functionality to the developers and testers. Use case modeling techniques play a pivotal role in the business analysis and a good foundation for requirements prioritisation.

Use case specification

Use case specification is a textual description of the details and steps of a use case. It elaborates on the flow of events, the preconditions, the postconditions, the assumptions, the exceptions, and the alternative paths of a use case. A use case specification can help in document the detailed requirements and logic of a system, as well as the expected outcomes and behaviors. Use case specifications in business analysis serve as detailed descriptions of interactions between users and a system to achieve specific goals.

1. Actor: Identify the primary actor initiating the use case. This could be a user or an external system.
2. Description: Provide a brief overview of what the use case accomplishes and why it's important.
3. Preconditions: List any necessary conditions that must be true before the use case can begin.
4. Basic Flow: Outline the main steps the actor takes to accomplish the use case under normal conditions.
5. Alternative Flows: Document any deviations or alternative paths that the actor might take during the use case.
6. Postconditions: Describe the state of the system after the successful completion of the use case.
7. Exceptional Conditions: Identify potential errors or exceptional situations that could occur during the execution of the use case and how they should be handled.
8. Frequency: Specify how often this use case is expected to occur.
9. Assumptions: Document any assumptions made during the creation of the use case.
10. Dependencies: List any other use cases or external factors that this use case depends on.
11. Notes: Include any additional information or considerations relevant to the use case.

By following these specifications, business analysts can ensure that use cases are well-defined, understood, and implemented accurately within the system.BA can use a use case specification to refine and clarify the use case diagram, as well as to provide a basis for the design, development, and testing of the system.

Activity diagrams

An activity diagram is a type of UML behavioral diagram that describes what needs to happen in a system.Activity diagrams visualize use cases at a more detailed level. Business analysts can use them to illustrate the flow of events in a business process, or the flow activities through a system. They are particularly useful for communicating processes and procedures to stakeholders from both the business and development teams.

Uses of Activity Diagrams in Business Analysis:

1. Process Modeling: Helps in understanding and documenting business processes.
2. Identifying Bottlenecks: Pinpoints areas where processes might slow down or encounter inefficiencies.
3. Communication Tool: Provides a visual representation that can be easily understood by stakeholders.
4. Requirements Analysis: Aids in defining requirements by clarifying the sequence of activities and interactions

System Design: Assists in designing software systems or workflows based on business processes.

Data modeling

Generally, data modeling is the process of graphically representing data structures and their relationships within a system or database in a precise form called the data model. The process may involve the creation of three data models defined at different abstraction levels, namely:

- Conceptual data model - this model defines high-level entities or concepts and their relationships in a business, leaving further details about the entities (for example, their attributes or types) for the next steps of modeling. The model is a rather technology-independent specification of the data in the database. The main focus is on what data is being used and how it's related, without including technical details.
- Logical data model - this model defines the structure of the data elements and their relationships, regardless of how the data will be stored physically. It's a refined version of the conceptual model and provides a blueprint for the physical database design.
- Physical data model - this model represents how the data will be stored in the database. The model incorporates any changes necessary to achieve adequate performance and includes details like data types and indexes. It's the basis for actual database implementation.

There are various data modeling tools and techniques available to business professionals. For example, Entity-Relationship Diagrams (ERDs), Data Flow Diagrams (DFD), Unified Modeling Language (UML) diagrams, and Data Definition Language (DDL) statements.

Finally, data modeling is important for designing and developing databases, software applications, and information systems within an organization.

However, it is data modeling that plays a key role in business analysis in many ways - for instance:

- Data modeling helps business analysts understand and document the data requirements of an organization, as well as gain insights into what kind of data is necessary to support various business processes.

- Data modeling provides a clear and standardized way of illustrating data structures, allowing business analysts to effectively communicate data requirements to different stakeholders.
- Business analysts can use data models to identify gaps in existing data structures and inconsistencies in business rules, hindering the successful implementation of business processes and systems.
- Data models provide a framework for organizing the data that business analysts need to analyze to make informed decisions and provide recommendations to stakeholders.
- Data models help software developers understand the data requirements and design systems that align with the business needs.
- By using data modeling, business analysts can design integrated data structures that facilitate the data exchange between different systems and applications.
- Data models provide business analysts with a structured way to assess how changes in data requirements affect business processes and ensure their continuous alignment with business objectives.

Overall, data modeling is essential for business analysis as it helps understand, document, and communicate complex business processes and data requirements. Without it, business analysts cannot develop solutions that align with business goals and efficiently manage and use data resources.

Data flow diagrams (DFDs)

Data flow diagrams (DFDs) are powerful tools that allow business analysts to visualize and analyze the data flow within a system. A data flow diagram (DFD) is a graphical representation of the data flow within a system.They visually represent the sequence of actions, decision points, and parallel activities in a business process or workflow. It provides a visual tool for understanding how information moves from one process to another, highlighting the inputs, outputs, and processes involved in the system.

Entity-relationship diagram

An entity-relationship diagram (ER diagram) illustrates how entities like people, objects, or concepts relate to one another in a system. For example, an ER diagram could show how the terms in an organization's business glossary relate to one another.

ER diagrams comprise three main parts:

- Entities
- Relationships
- Attributes

Attributes apply to the entities, describing further details about the concept. Relationships are where the key insights from ER diagrams arise. In a visual model, the relationships between entities are illustrated either numerically or via crow's foot notation.

These diagrams are most commonly used to model database structures in software engineering and business information systems and are particularly valuable tools for BAs in those fields

In business analysis, an Entity-Relationship (ER) diagram is a valuable tool for visualizing and understanding the relationships between various entities within a system or organization. ER diagrams are particularly useful for:

1. Understanding Data Relationships: ER diagrams help business analysts understand how different entities are related to each other in a system or business process.
2. Identifying Key Entities: They help in identifying the key entities involved in a business process or system and their attributes.
3. Clarifying Business Requirements: ER diagrams can clarify business requirements by providing a graphical representation of the data model, which can be easier for stakeholders to understand.

4. Communication Tool: They serve as a communication tool between business analysts and stakeholders, helping to ensure that everyone has a clear understanding of the data model.
5. Database Design: ER diagrams often serve as the foundation for database design, helping developers to design databases that accurately reflect the business requirements.

Overall, ER diagrams play a crucial role in business analysis by facilitating communication, understanding data relationships, and aiding in the design of efficient systems and databases.

Page designs

Page design in business analysis refers to the layout, structure, and presentation of information on documents or reports used for analyzing business processes, data, or requirements. Effective page design in business analysis is crucial for clarity, readability, and conveying complex information in a meaningful way.

Here are some key aspects of page design in business analysis:

1. Clarity: Ensure that the layout is clear and easy to follow. Use headings, subheadings, and bullet points to break down information into digestible chunks.
2. Consistency: Maintain consistency in fonts, colors, and formatting throughout the document to create a cohesive look and feel.
3. Whitespace: Incorporate ample whitespace to avoid clutter and improve readability. White space helps to separate elements and draw attention to important information.

4. Visual Elements: Use charts, graphs, diagrams, and tables to illustrate data and concepts. Visual elements can help stakeholders better understand complex information at a glance.
5. Hierarchy: Organize information hierarchically, with the most important points or sections prominently featured. Use headings and subheadings to create a logical flow of information.
6. Alignment: Ensure that text, images, and other elements are aligned properly for a neat and professional appearance.
7. Accessibility: Design documents with accessibility in mind, considering factors such as font size, contrast, and alternative text for images to accommodate diverse audiences.
8. Branding: Incorporate company branding elements such as logos and color schemes to maintain brand identity and consistency.

By paying attention to these aspects of page design, business analysts can create documents that effectively communicate insights, findings, and recommendations to stakeholders and decision-makers.

Question 5 – Elicitation Techniques - 3 Marks

As a Business Analyst, What Elicitation Techniques you are aware of? (BDRFOWJIPQU)

What Is Elicitation?

Many of the technical or business requirements are not formally documented anywhere. Typically, the requirements exist only in the minds of Subject Matter Experts and stakeholders.

Business analysts, therefore, have to draw out or elicit the requirements to gain access to relevant data. The methodology of elicitation must also be meticulous and logical.

Elicitation is the cornerstone of any project, as it plays a critical role in bringing the requirements for a project to the table. Scientists and engineers agree that elicitation errors are one of the most common causes of project failures and abandonment that negatively impact the bottom line.

To avoid the possibility of fatal mistakes hampering a project, adequate research and preparation are hence necessary for the elicitation process.

Simply put, the goal of a requirements elicitation is to exhaustively identify the assumptions, risks, and needs involved in any project.

What Is Requirement Elicitation in Business Analysis?

Requirements elicitation is one of the most complex, error-prone, communication-intensive, and challenging stages of the software development process, as it is pivotal in determining the budget, time estimate, and scope of a project. The clarity of requirements elicitation should be exceptional in order to deliver solutions that end-users find useful and satisfying.

The Business Analysis Body of Knowledge (BABOK) Guide states that the primary responsibility of a Business Analyst is to make the requirements elicitation process complete and clear. Incorporating requirements elicitation into business analysis practices enables Business Analysts to act as a bridge between developers, stakeholders, and end-users, thereby facilitating the seamless development of applications that are responsive to customer requirements.

Requirements Elicitation Techniques

Brainstorming

The requirements elicitation process begins with brainstorming. To facilitate focused and fruitful brainstorming sessions, business analysts should set up a team with representatives of all stakeholders for capturing new ideas, identify the ***root causes*** of problems, as well as solve complex business problems. During **requirements gathering,** brainstorming can be used to get a variety of ideas from a group of people and to identify possible solutions to problems and may also be combined with voting to prioritize ideas. Brainstorming can also be used to make requirements clear and is one of the best ways to generate lots of ideas on a particular topic in a short period of time. Suggestions coming out of brainstorming sessions should be properly documented in order to draft the plan of action.

Document Analysis

During this step of the requirements elicitation process, business analysts review existing documentation at hand, with the intent of identifying requirements for changes or improvements. Examples of document analysis sources include pre-existing project plans, system specifications, process documentation, market research dossiers, customer feedback, meeting minutes, and user manuals.Document analysis can also be effective when stakeholders are not available to supply information during the ***requirements gathering*** process. Document review can also help during the creation of the as-is process flow diagrams in the business requirements document. Document analysis is performed before scheduling more in-depth requirements elicitation sessions or interviews with stakeholders.

Focus Group

A focus group involves a gathering of stakeholders who represent the customer and can be used to collect information in a relatively short period of time. In a focus group, multiple viewpoints can be shared and discussed with the assistance of a facilitator. The feedback gathered from a focus group can be used to identify or validate requirements. A focus group can also be used as a way of identifying the stakeholder's attitudes and beliefs about the solution.

Interviews

A great way to extract critical data is via interviews. Business analysts engage in group or one-to-one interviews in an informal or formal setting to elicit project requirements through questions directed at Subject Matter Experts, stakeholders, and end-users. By exploring diverse opinions, business analysts gain in-depth knowledge of the requirements. Business analysts can use elicitation techniques, like either structured or unstructured interviews, depending on the situation. A structured interview uses preset questions, which are asked to stakeholders, and an unstructured interview uses spontaneous questions, which are not determined in advance. Interviews offer a business analyst an opportunity to establish rapport with the interviewee and get instant feedback.

Observation

Also referred to as job shadowing, observation is an excellent elicitation technique that helps understand requirements based on observations related to process flows and work environments of stakeholders. Practical insights into actual workflows serve as the basis for modifications and enhancements. Observations can be used effectively with other techniques such as interviewing and surveys to help gather and validate requirements. In passive observation, business analysts do not interact with the stakeholders during the observation process, while in active observation, the business analyst can interact with the stakeholders and ask questions or even participate in the

activities. The observation approach allows business analysts to elicit real-world data that other requirements elicitation methods cannot capture.

Prototyping

One of the most important phases of the requirements elicitation process, prototyping enables business owners and end-users to visualize realistic models of applications before they are finally developed. Prototyping helps generate early feedback, and it boosts stakeholder participation in requirements elicitation. The prototype can be shown to the ***stakeholders, who will review and give recommendations for improvement so as to meet business*** requirements. Prototypes are very effective, particularly where the solution, involves the implementation of new technology and can help stakeholders visualize what the final product will look like.

Workshops

For multi-stakeholder, complex projects, workshops are one of the most resource-efficient methods to elicit requirements. Intense, focused, and highly productive workshops have a key role to play in getting all parties onto the same page. During a requirements workshop, a facilitator will play a leading role by presenting the topics to be discussed as well as coming up with documentation. Workshop events help Subject Matter Experts and Stakeholders to collaborate, resolve conflicts, and come to an agreement.

Joint Application Development (JAD)

Joint Application Development (JAD) is a requirements elicitation technique that brings together stakeholders, end-users, and SMEs to collaboratively identify and define system requirements. It is a structured workshop-based approach that aims to improve the quality and accuracy of requirements by involving key stakeholders in the process.

The business analyst will act as the JAD facilitator. JAD is an effective requirement elicitation technique because it brings together stakeholders and subject matter experts to collaborate and develop a shared understanding of the system requirements.

Survey

When multiple Subject Matter Experts and stakeholders are involved in a project, business analysts conduct a survey for the elicitation of requirements.A survey is a data-gathering method that is used to collect, analyze, and interpret the views of a group of people from a target population. Everyone involved is given a questionnaire to fill out. Subsequently, the responses are analyzed to refine the requirements. Surveys are less expensive than other requirements elicitation techniques, easy to administer, and can produce both qualitative and quantitative results.

Reverse engineering

This elicitation technique is generally used in migration projects. If an existing system has outdated documentation, it can be reverse engineered to understand what the system does. This is an elicitation technique that can extract implemented requirements from the system.

Question 6 – This project Elicitation Techniques - 1 Marks

Which Elicitation Techniques can be used in this Project and Justify your selection of Elicitation Techniques?

As a BA I select Prototyping and Brainstorming.Because during a brainstorming session, the participants are encouraged to share their ideas. It is a way to think outside the box and to get people thinking about ideas and solutions that might not

come to mind in a more formal elicitation session. After the initial requirements gathering gets over, the prototyping technique is applied in the final phase to refine the stakeholder's requirements. Prototypes help the development team with a clear understanding of the vague requirements. Since prototypes are the model of the end product, it actually helps end-users to feel how will their product look in real-time.

Question 7 – 10 Business Requirements- 5 Marks

Make suitable Assumptions and identify at least 10 Business Requirements.

Req ID	Req Name	Req description
BR001	Farmar search for product	Farmer should be able to search for products seeds fertilizer pesticides
BR002	Manufacture upload their product	Manufacture should be able to upload and display their products in the application
BR003	Farmer buy /return product	Customer friendly options and policies
BR004	Manufacture sell products	Should show how many products are left
BR005	Farmer account	Should have history of purchase tracking options
BR006	Catalogue	Should be categorized for easy search
BR007	Filter	Should have option

		to optimize the product
BR008	Offers	Should show discount coupons
BR009	Date	Expiry date of the product should be mentioned
BR0010	Register	Farmer should be able to register with email id or phone number
BR0011	Application	Application should be beginner and user friendly
BR0012	Payment	Application should have all types of payment modes

Question 8 –Assumptions- 2 Marks

List your assumptions

Assumption 1:Farmer will have access to network and smartphones

Assumption 2:Farmer will be aware of online agriculture shopping application

Assumption 3:Farmers will utilize the user friendly application over physical agriculture store

Assumption 4:All Manufacturing companies will up display their products

Assumption 5:Shopping experience will be smooth and easy for the buyers

Assumption 6:All the searching products will be available to the farmers

Assumption 7:Payment modes are suitable for all type of farmers

Assumption 8:Farmers will have good shopping experience and will receive the product on time

Assumption 9:The product will reach in good condition if not return the product will be easy for farmers

Assumption 10:Shipping will be available for all the farmer places

Question 9 – This project Requirements Priority - 1 Marks

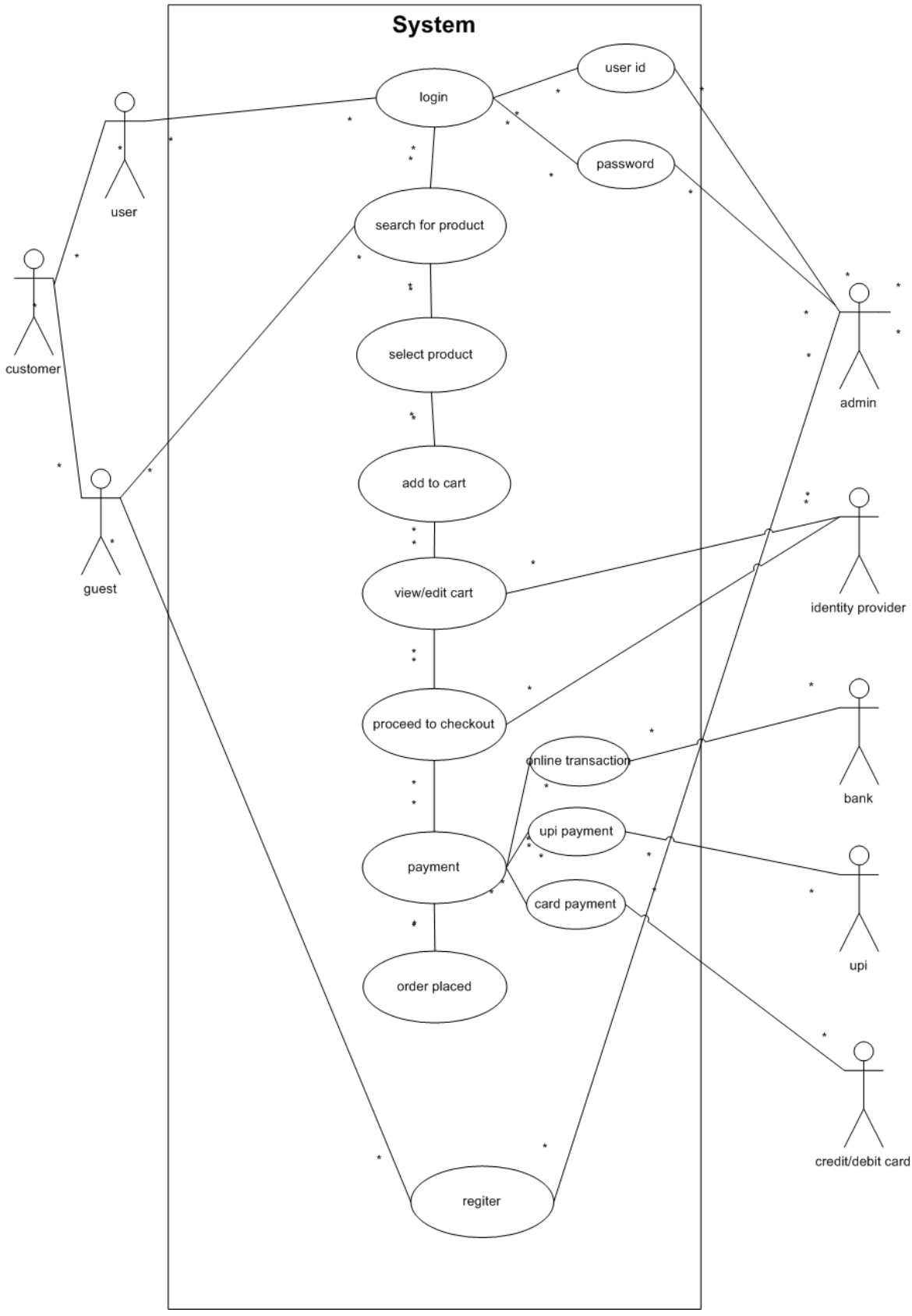
Give Priority 1 to 10 numbers (1 being low priority – 10 being high priority) to these Requirements after discussions with the stakeholders.

Req ID	Req Name	Req description	Priority
BR001	Farmar search for product	Farmer should be able to search for products seeds fertilizer pesticides	8
BR002	Manufacture upload their product	Manufacture should be able to upload and display their products in the application	8
BR003	Farmer buy /return product	Customer friendly options and policies	7
BR004	Manufacture sell products	Should show how many products are left	6
BR005	Farmer account	Should have history of purchase tracking options	6

BR006	Catalogue	Should be categorized for easy search	8
BR007	Filter	Should have option to optimize the product	7
BR008	Offers	Should show discount coupons	6
BR009	Date	Expiry date of the product should be mentioned	7
BR010	Register	Farmer should be able to register with email id or phone number	9
BR011	Application	Application should be beginner and user friendly	9
BR012	Payment	Application should have all types of payment modes	9

Question 10 – Use Case Diagram - 3 Marks

Draw use case diagram


System
user id
login
password
user
search for product
customer
select product
admin
add to cart
guest
view/edit cart
identity provider
proceed to checkout
online transaction
bank
upi payment
payment
card payment
upi
order placed
credit/debit card
regiter

Question 11 – (minimum 5) Use Case Specs - 3 Marks

Prepare use case specs for all use cases

Actor	Customer
Description	Customer can be able to login into the site
Precondition	Customer must have user id
Post condition	Customer logged into the site
Trigger	Customer wants to register
Primary flow	Customer trying to login with registered user id and successfully logged in
Alternative flow	System show invalid id and prompts the customer to relogin

Actor action	**System response**
Customer open site	System display login page
Customer types user id and password	System verify the user id and password
Customer click the login	System show the homepage
Customer directed to home page	

Actor	Customer
Description	Customer can be able to search for product
Precondi	Customer must be logged in

tion	
Post condition	Customer add the product to cart
Trigger	Customer wanted to buy product
Primary flow	Customer successful searched the desired product
Alternative flow	None

Actor action	**System response**
Customer click the search tab	System show search tab
Customer enter the product	System verify the product
Customer see the product and other options	System show the product and other options
Customer click the product	System verify and process the action
Customer add the product to cart	System show the product in cart

Actor	Customer
Description	Customer buy product
Precondition	Customer must have product in the cart
Post condition	Customer successfully bought the products
Trigger	Customer wants to buy product
Primary flow	Customer bought the product from the cart
Alternative flow	If the product is out of stock display the message

Actor action	**System response**
Customer click the cart	System show the cart
Customer select the products	System show product and process it
Customer click buy	System show buy option
Customer proceed to pay	System show pay option

Actor	Customer
Description	Customer pay for product
Precondition	Customer must have clicked the buy option
Post condition	Customer successfully finished payment
Trigger	Customer want to pay for product
Primary flow	Customers pay for the product
Alternative flow	Customer redirect to cart again and show message payment failed

Actor action	**System response**
Customer click buy option	System show buy option and process it
Customer select the payment mode	System show payment modes to select
Customer enter card details	System show the enter card details
Customer click proceed to pay	System veriy the card details
Customer enter otp	System show enter otp

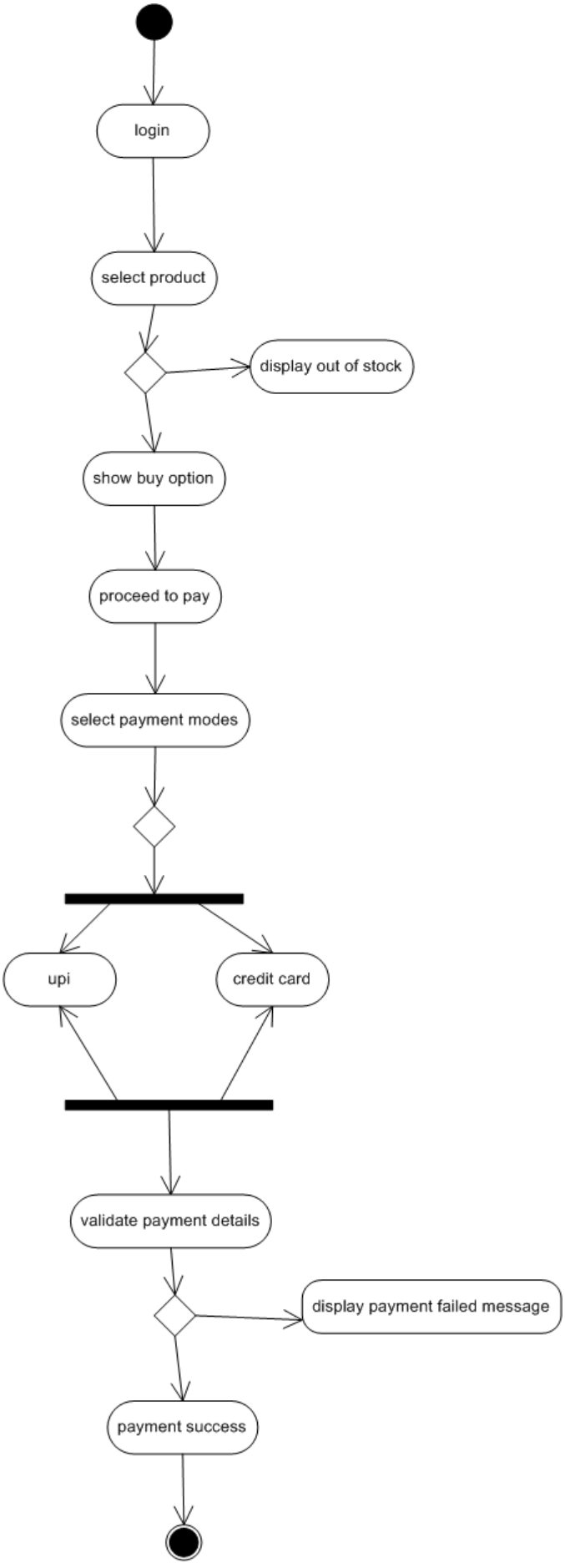
Actor	Customer
Description	Customer edit the cart
Precondition	Customer must have products in cart
Post condition	Customer edited the cart
Trigger	Customer wants to remove few product from the cart
Primary flow	Customer edit the cart successfully by removing item

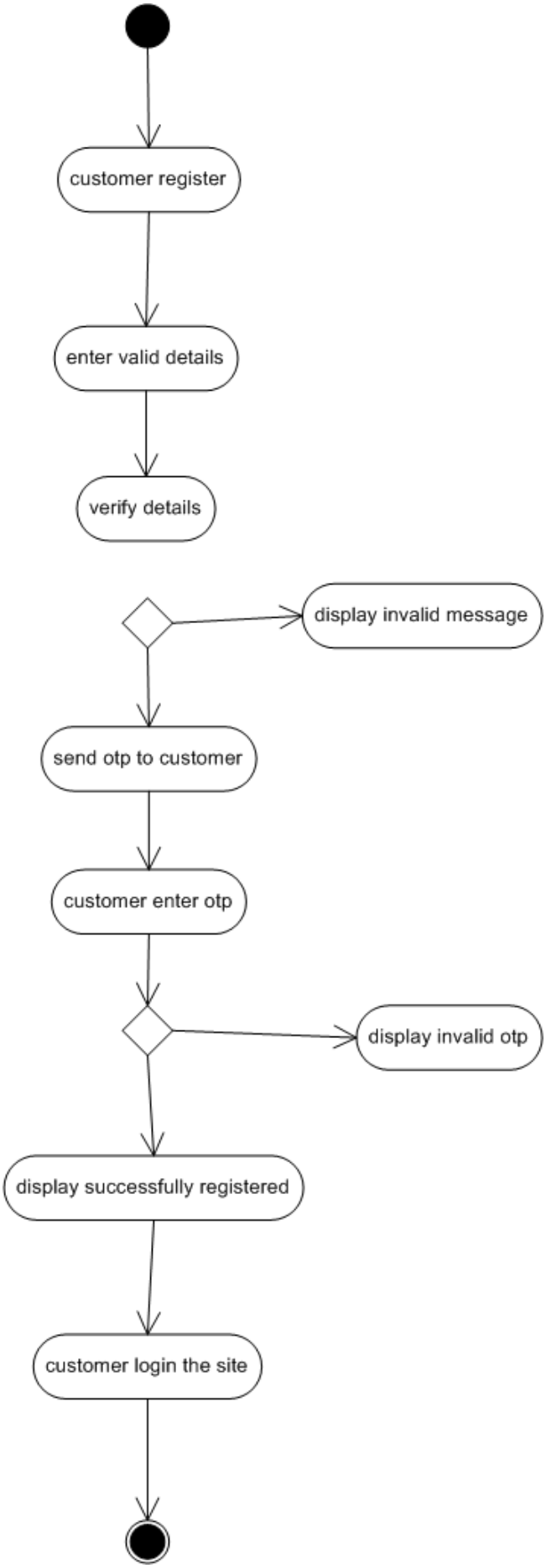
Alternative flow	Customer see the message error and redirect to cart
Actor action	**System response**
Customer click the cart	System show cart
Customer select the product	System process and show product
Customer click remove option	System verify and process the action
Customer removed the product	System update the cart

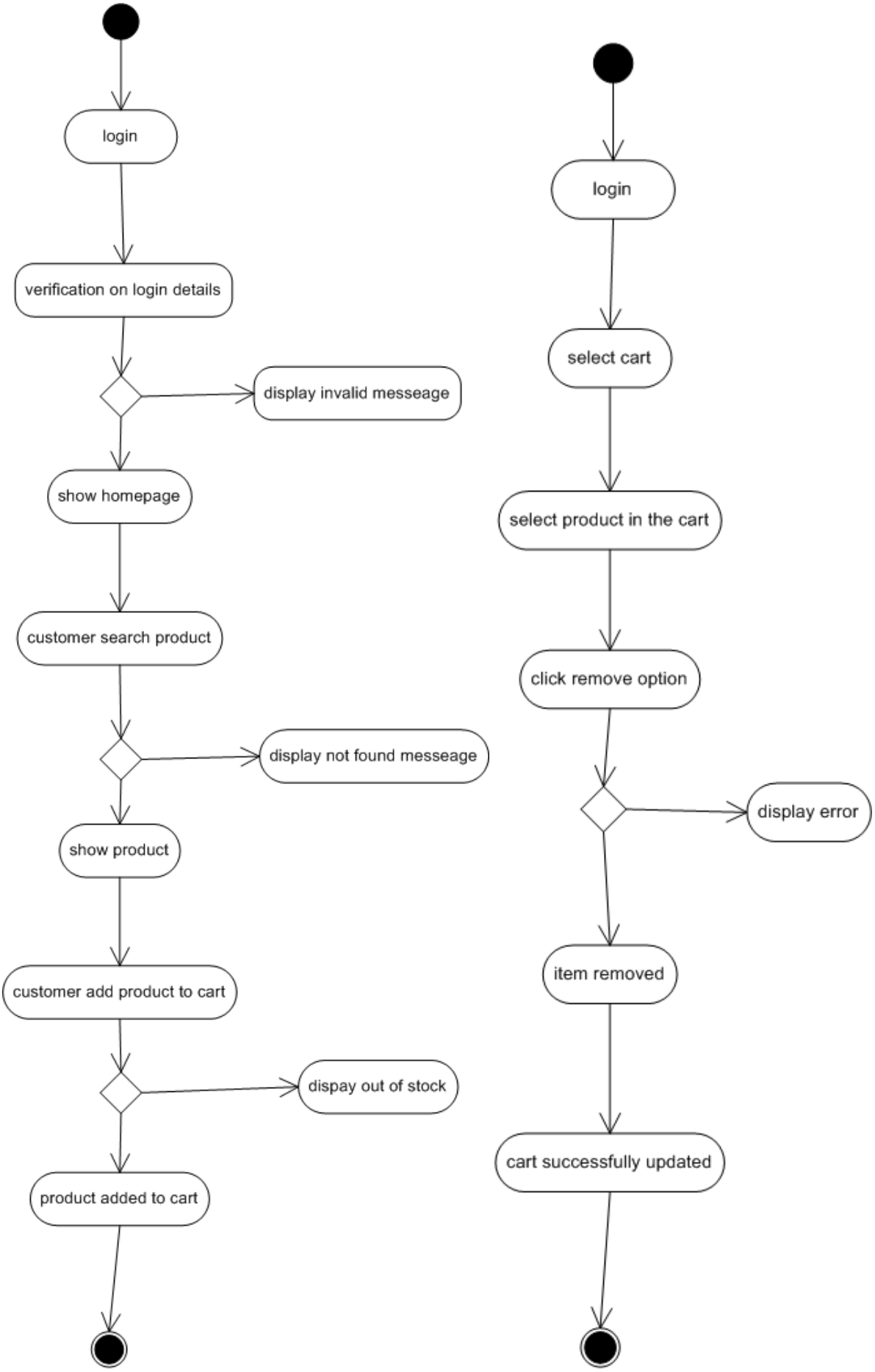
Question 12 – (minimum 5) Activity Diagrams - 3 Marks

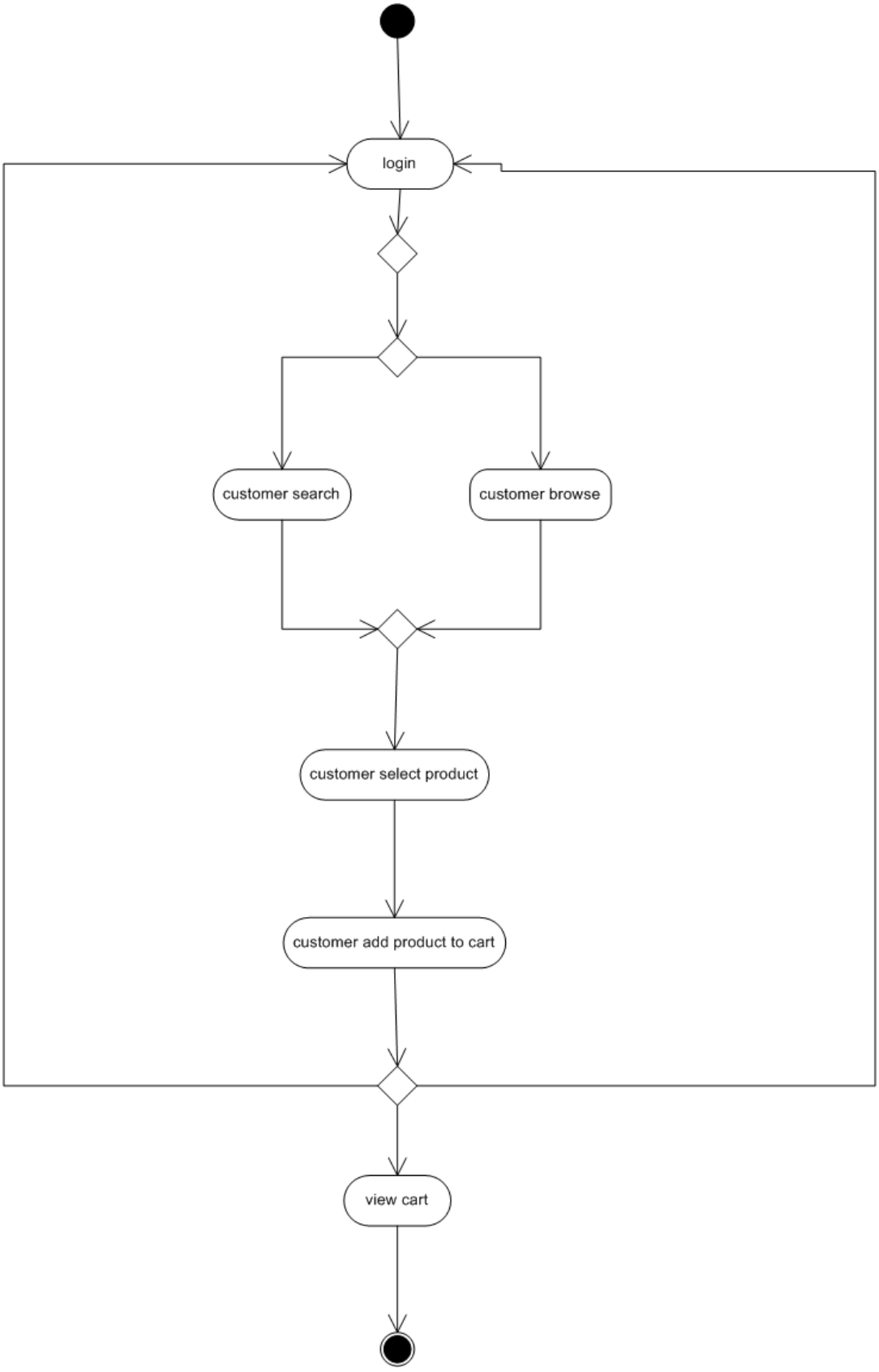
Activity diagrams

Browse,Payment,Register,Search,Update cart


login
select product
display out of stock
show buy option
proceed to pay
select payment modes
upi
credit card
validate payment details
display payment failed message
payment success


customer register
enter valid details
verify details
display invalid message
send otp to customer
customer enter otp
display invalid otp
display successfully registered
customer login the site


login
verification on login details
display invalid messeage
show homepage
customer search product
display not found messeage
show product
customer add product to cart
dispay out of stock
product added to cart
login
select cart
select product in the cart
click remove option
display error
item removed
cart successfully updated


login
customer search
customer browse
customer select product
customer add product to cart
view cart