1. **Identify Business Process Model for Online Agriculture Store – Goal, Inputs, Resources ,Outputs, Activities, Value created to the end Customer**

Ans:1. **Goal**: To create an online platform (web/mobile app) that connects farmers with agriculture product manufactures (fertilizers, seeds, pesticides) to facilitate easy, affordable and timely procurement of products, especially for farmers in remote areas

2.**Inputs**: Farmer needs: Fertilizers, Seeds, Pesticides.

Manufacturer Data: Product details (name, category, price, stock, description).

Technology: Web/Mobile application, Internet connectivity.

Budget & Resources: 2 Crores budget, 18 months duration, development team.

Stakeholder Requirements: Farmers (end-users), Companies (suppliers), SOONY Committee (sponsor)

3. **Resources:** Human Resources: Business analyst -requirement gathering, documentation.

Developers -Java Team: Juhi, Teyson, Lucie, Tucker, Bravo

DB Admin-John

Network Admin -Mike

Testers -Jason, Alekya

Project Manager -Vandanam

Delivery Head -Karthik

4.**Activities**: Farmer Registration - Farmers create accounts on the platform.

Manufacturer Onboarding -Companies register and upload product details.

Product Catalog Management - System displays fertilizers, seeds, pesticides.

Browsing & Searching - Farmers browse/filter products.

Order Placement - Farmers select products, add to cart, and place orders.

Payment Processing - Online payment or Cash-on-Delivery.

Order Fulfillment - Manufacturers confirm and dispatch orders.

Logistics & Delivery - Products shipped to farmers' location.

Feedback & Reviews - Farmers rate and review products/suppliers.

Admin Monitoring -SOONY/Platform Admin manages users, products, and transactions

5.**Outputs:**

- Functional Online Store -Web/Mobile App.
- Easy product access for farmers fertilizers, seeds, pesticides
- Direct communication between farmers and companies.
- Order & delivery management system**.**
- Reports & dashboards -usage, sales, demand trends

6.**Value**: Convenience, Accessibility ,Cost-effectiveness, Transparency, Trust & Empowerment

2. **Mr Karthik is doing SWOT analysis before he accepts this project. What Aspects he Should consider as Strengths, as Weaknesses, as Opportunity and as Threats.**

Ans: Strengths (Internal positive factors)

- Clear Business Goal -Strong CSR initiative by Mr. Henry (social impact + goodwill).
- Dedicated Budget & Timeline - 2 Crores allocated and 18 months available.
- Strong Development Team -Skilled pool (Java developers, testers, DB/network admins).
- Direct Stakeholder Involvement - Farmers (Peter, Kevin, Ben) available for real requirements.
- Support from Sponsor - Mr. Henry's personal interest ensures leadership commitment.

Weaknesses (Internal Negative Factors**)**

- Limited Digital Literacy among Farmers -Need for very user-friendly design.
- Connectivity Issues in Rural Areas -Internet access may limit usage.
- Complexity of Multi-Language Support - Farmers may speak different regional languages.
- Logistics Dependency- Platform success relies on reliable delivery mechanisms.
- Budget Constraints -2 Crores may be tight if requirements expand (scope creep risk).
- New Domain for IT Team -Team may lack agriculture-specific knowledge.

Opportunities (External Positive Factors)

- Large Untapped Market -Millions of farmers in India and beyond face the same issue.
- Expansion Possibilities- Future integration with crop advisory, government schemes, weather info, and subsidies.
- Partnership Potential -Tie-ups with logistics companies, payment providers, and agri-tech startups.
- Scalability Platform can later extend to farm equipment, consultancy, or e-learning for farmers

Threats (External Negative Factors): market, competition, and operational risks

3. **Mr Karthik is trying to do feasibility study on doing this project in Technology (Java), Please help him with points (HW SW Trained Resources Budget Time frame) to consider in feasibility Study**

Ans: Hardware Requirements: Servers / Hosting

- Application Server: High-availability cloud/VPS (e.g., AWS, Azure, GCP).
- Database Server: Dedicated DB cluster with backup & recovery.
- Storage: Adequate disk space for product catalog, farmer data, order transactions.
- Load Balancer: To handle concurrent user traffic

Software (SW) Requirements

Application Development:

- Backend: Java (Spring Boot framework).
- Frontend (Web): HTML5, CSS3, JavaScript, React/Angular (optional).
- Mobile App: Android (Java/Kotlin) and iOS (Swift/React Native).
- APIs: REST APIs for integration between web and mobile.

Database:

- SQL-based (MySQL/PostgreSQL/Oracle DB)

Resources:

Already Available in APT IT Solutions (per case study)

- Java Developers: 1 Senior (Juhi) + 4 Developers (Teyson, Lucie, Tucker, Bravo).
- DB Admin: John.
- Network Admin: Mike.
- Testers: Jason, Alekya.
- Project Manager: Vandanam.
- BA (You) for requirement gathering & documentation

Budget Feasibility

- Approved Budget: 2 Crores.
- Estimated Breakdown:
  - Development & Testing: -80–100 Lakhs.
  - Infrastructure & Hosting: -30–40 Lakhs.
  - Licenses, Tools & Security: -20–30 Lakhs.
  - Training & Resource Upskilling: -10–20 Lakhs.
  - Contingency & Maintenance: -30–40 Lakhs

Time Frame Feasibility

- Planned Duration: 18 Months.
- Possible Phase-Wise Delivery:
  - Phase 1 (0–3 months) -Requirement gathering, architecture design, prototypes.
  - Phase 2 (4–9 months) - Backend (Java), Database setup, APIs.
  - Phase 3 (10–14 months) -Web & Mobile app development, integration, security.
  - Phase 4 (15–17 months) - Testing (UAT, performance, security testing).
  - Phase 5 (18 months) Go-live + handover

4. **Mr Karthik must submit Gap Analysis to Mr Henry to convince to initiate this project. What points (compare AS-IS existing process with TO-BE future Process) to showcase in the GAP Analysis.**

Ans: Product Procurement Process

	AS-IS (Current State)	TO-BE (Future State)
Procurement	Farmers travel long distances to buy fertilizers, seeds, pesticides; limited stock availability	Farmers order products online anytime; wide availability
Access to Companies	No direct connection; dependent on local dealers/middlemen.	Farmers connect directly with manufacturers via app
Information	Farmers rely on shopkeepers or word-of-mouth; often incomplete.	App provides product details, usage info, and reviews
Pricing	Prices controlled by middlemen; no transparency	Farmers compare prices online; fair and transparent rates
Delivery	Farmers carry goods themselves from shops/markets	Doorstep delivery to farmers' locations
Payment	Cash transactions only; risky and inconvenient	Multiple secure options – UPI, wallets, bank transfer, COD
User Experience	Manual, time-consuming, tiring	Simple, user-friendly mobile/web application in local language

5. **List down different risk factors that may be involved (BA Risks And process/Project Risks)**

Ans:- 1. Business Analyst (BA) Risks:

- incomplete or Ambiguous Requirements:
  Farmers (end users) may not clearly articulate their needs due to lack of IT knowledge.
- Communication Gaps:
  Farmers in remote villages may have language/technology barriers.
- Unrealistic Expectations:
  Stakeholders may expect faster delivery or advanced features beyond scope.
- Changing Requirements
  Farmers' needs may evolve during 18 months, causing scope creep.
- Conflicting Requirements:
  Different stakeholders (farmers vs. manufacturers vs. committee) may have contradictory priorities.
- Limited Stakeholder Availability:
  Farmers may not be available regularly for workshops/interviews.
- Insufficient Domain Knowledge:
  BA may lack deep understanding of agriculture supply chain.

- Improper Documentation:
  Missing BRD/FRD details could lead to misinterpretation by developers**.**
- **Process / Project Risks**

  1. Cost risks:

  Budget Overrun:
  Actual costs (infra, licenses, training, logistics integration) may exceed 2 Crores.

  Hidden Costs:
  Additional costs for rural language support, farmer training programs

  2. Timeline Risks

  Schedule Slippage:18 months may not be enough if requirements keep changing.

  Delays in Feedback:
  Farmers and committee may take time to validate feature

  3. Technical Risks

  Connectivity Issues:
  Farmers in remote villages may have poor internet access.

  Technology Adoption:
  Farmers may struggle to adopt mobile/web app if it is not simple.

  System Performance Risks:
  High load during seasonal demand (fertilizer/seed sales peak

6. Perform stakeholder analysis (RACI Matrix) to find out the key stakeholders who can take Decisions and Who are the influencers

Ans: RACI Stakeholder Analysis

Name	**Designation**	**Role in Project**	**R/A/C/I**	**Details (Decision Maker / Influencer / Support**
Mr. Henry	Sponsor, Owner of SOONY	Business Vision, CSR Initiative	A/R	Key Decision Maker – Approves scope, go-live, overall vision
Mr. Pandu	Financial Head, SOONY	Budget Approvals	A/C	Decision Maker (Finance) – Controls funds, approves spend
Mr. Dooku	Project Coordinator, SOONY	Committee Member	C	Influencer – Coordinates between SOONY & Vendor
Peter, Kevin, Ben	Farmers (End Users)	Requirement Providers	C/R	Influencers – Represent farmer needs, validate usability
Committee (Henry + Pandu + Dooku)	Governance Body	Oversight, Governance	A	Decision Maker Group – Approves critical milestones
Mr. Karthik	Delivery Head, APT IT Solutions	Vendor Leadership	A/R	Influencer – Ensures delivery success, manages client relationship

Mr. Vandanam	Project Manager, APT IT Solutions	Project Execution	R	Influencer – Manages project plan, schedule, risks
You (BA)	Business Analyst	Requirement Gathering, Gap Analysis	R/C	Influencer – Bridges business & tech, ensures clarity
Ms. Juhi	Senior Java Developer	Development Lead	R	Executes technical design, mentors dev team
Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo	Java Developers	Coding	R	Responsible for feature implementation
Mr. Mike	Network Admin	Infrastructure Setup	R	Supports hosting, connectivity, network configuration
John	DB Admin	Database Design & Maintenance	R	Ensures data availability, integrity, performance
Mr. Jason & Ms. Alekya	Testers	QA & UAT Support	R	Responsible for testing, quality assurance

7. -Help Mr Karthik to prepare a business case document

Ans: Why is this project initiated?

The project is initiated to address the challenges faced by farmers in remote areas in procuring essential agricultural inputs such as fertilizers, seeds, and pesticides. Mr. Henry, motivated by the struggles of his childhood friends (Peter, Kevin, and Ben), identified this as a widespread issue and decided to launch a CSR-funded digital platform (Web + Mobile) to directly connect farmers with manufacturing companies.

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2. What are the current problems?

- Farmers in villages face difficulty in accessing fertilizers, seeds, and pesticides.
- Limited availability of local stores.
- Middlemen increase costs and delays.
- Lack of transparency in product pricing and quality.
- Farmers are dependent on unreliable supply chains.

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3. With this project, how many problems could be solved?

The proposed online store will solve multiple issues:

- Farmers will have direct access to companies (removes middlemen).
- Easy product availability (fertilizers, seeds, pesticides) via catalog.
- Timely delivery to farmer locations.
- Transparency in price & quality through company listings.

- Digital convenience (browse, order, track deliveries).
- Future-ready platform to expand into other agri-products.

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4. What are the resources required?

Human Resources (APT IT SOLUTIONS):

- Project Manager: Mr. Vandanam
- Developers: Ms. Juhi (Senior Java Dev), Mr. Teyson, Ms. Lucie, Mr. Tucker, Mr. Bravo
- DB Admin: John
- Network Admin: Mr. Mike
- Testers: Mr. Jason, Ms. Alekya
- Business Analyst: [You]

Technical Resources:

- Cloud Infrastructure (Hosting, Database, Storage)
- Secure Payment Gateway
- Mobile & Web Application Frameworks (Java, Spring Boot, Angular/React, Android/iOS)
- Multilingual Support System
- Delivery/logistics integration APIs

Financial Resource:

- Budget: 2 Crores (CSR by SOONY)

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5. How much organizational change is required to adopt this technology?

- Low-to-Medium Change
    - Farmers need basic digital onboarding → training in regional languages.
    - Manufacturers need to register and upload product details.
    - Delivery/logistics partners need integration with the platform.
- Since it is CSR-driven, adoption efforts (awareness campaigns, training workshops) will be part of implementation.

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6. What is the time frame to recover ROI?

- As this is a CSR initiative, direct financial ROI is not the primary focus.
- Social ROI (Return on Investment) in terms of farmer welfare, brand goodwill, and long-term economic improvement can be seen within 2–3 years of adoption

8. **Mr Karthik explained to Mr. Henry about SDLC. And four methodologies like Sequential Iterative Evolutionary and Agile. Please share your thoughts and clarity on Methodologies**

Ans: Sequential (Waterfall Model)

- How it works: Each phase (Requirement → Design → Development → Testing → Deployment → Maintenance) is completed one after another, like a waterfall flowing down.
- Best suited for: Projects where requirements are well-defined, fixed, and not expected to change.
- Advantages:
    - Simple and easy to manage.
    - Clear milestones and documentation.
- Disadvantages:
    - Very rigid.
    - Changes after development starts are costly and difficult.
    - Testing comes late, so issues are discovered late.

Example: Building a bridge—you cannot change the design once construction starts.

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2. Iterative Methodology

- How it works: The project is divided into small iterations (mini-projects). Each iteration delivers a working part of the system, and then the next iteration improves upon it.
- Best suited for: Projects where requirements may evolve gradually but core goals are known.
- Advantages:
    - Early versions of the product are available for feedback.
    - Issues can be corrected early.
    - Less risk compared to sequential.
- Disadvantages:
    - May require more resources.
    - Sometimes scope can expand if not controlled.

Example: Writing a book draft—you first write a rough draft, then keep improving it through iterations.

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3. Evolutionary Methodology

- How it works: Similar to iterative, but more focused on building a product that evolves as requirements emerge. Starts with a simple version (prototype/MVP) and gradually develops into the final system.

- Best suited for: Projects where requirements are uncertain or not clear from the beginning (common in innovation or research-based projects).
- Advantages:
    - High flexibility to accommodate changing needs.
    - End product fits user needs better because it evolves with user feedback.
- Disadvantages:
    - Can take longer time if changes are frequent.
    - Risk of never reaching a "final" product if scope is not controlled.

Example: Developing a new mobile app where features are added gradually based on user needs and trends.

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4. Agile Methodology

- How it works: Agile is an evolutionary + iterative approach, but more structured. Work is divided into short sprints (2–4 weeks) where teams deliver working features quickly. Continuous feedback from users helps improve the product at every stage.
- Best suited for: Projects where requirements are dynamic and customer collaboration is essential.
- Advantages:
    - Continuous feedback and collaboration with stakeholders.
    - Faster delivery of usable product.
    - Flexible to handle changes even late in the project.
- Disadvantages:
    - Requires strong team coordination.
    - Scope creep risk if not managed well.
    - Less documentation compared to traditional models

9. When the APT IT SOLUTIONS company got the project to make this online agriculture product store, there is a difference of opinion between a couple of SMEs and the project team regarding which methodology would be more suitable for this project. SMEs are stressing on using the V model and the project team is leaning more onto the side of waterfall model. As a business analyst, which methodology do you think would be better for this project?

Ans: I would recommend the V-Model over Waterfall, for this specific project, and here's why:

1. **User Base (Farmers) are New to Technology**
    - They need a very stable and bug-free application.
    - V-Model ensures testing is tightly integrated with every development stage.
2. **CSR Initiative Project (Reputation Critical)**

- This project is not just technical—it's Henry's vision and SOONY's CSR initiative.
- Delivering poor-quality software would damage trust.
- V-Model enforces quality from the beginning.

3. **Requirements Seem Stable, but Usability is Key**
   - The core scope (fertilizers, seeds, pesticides ordering) is fixed.
   - The major challenge is usability & correctness (e.g., simple navigation, language support, clear product details).
   - V-Model's early test planning ensures these are validated properly.
4. **Testing-Focused Approach Fits Well**
   - Farmers cannot afford application failures during peak farming seasons.
   - V-Model allows Acceptance Testing mapped directly to requirements, giving confidence to SMEs and Henry's committee.

10. Write down the differences between waterfall model and V mode?

Ans:

Aspect	**Waterfall Model**	**V-Model**
Definition	A linear & sequential SDLC model where each phase follows the other.	An extension of the Waterfall model where every development phase is mapped with a corresponding testing phase.
Focus	Process flow is mainly on development first, then testing at the end.	Equal focus on development and testing simultaneously.
Testing Approach	Testing starts after development is complete.	Testing activities are planned parallel to development.
Error Detection	Errors are detected late in the cycle, often costly to fix.	Errors are detected early, reducing cost and effort to fix.
Flexibility	Very rigid, hard to go back once a phase is completed.	Also rigid, but slightly better as testing is tied with each phase.
Risk Handling	Higher risk, since issues may surface late in testing.	Lower risk, as verification & validation happen throughout.
Quality Assurance	Quality is ensured mainly at the end during the testing phase.	Quality is ensured at each stage due to early test involvement.
Best Suited For	Projects with well-defined, stable requirements and low emphasis on early testing.	Projects where reliability, validation, and correctness are critical (e.g., healthcare, banking, CSR initiatives).

Aspect	Waterfall Model	V-Model
User Involvement	Limited, mostly at requirement and final acceptance stage.	Moderate, as requirements are validated early with test cases.
Example	Simple internal tool with fixed features.	Farmer-friendly CSR app where quality and correctness are crucial

11. As a BA, state your reason for choosing one model for this project ?

Ans: As a BA, I would recommend using the V-Model because:

- It provides early validation and verification.
- Ensures higher product quality.
- Reduces risk of late-stage failures.
- Aligns well with CSR objectives and stakeholders' expectations.

This model will help deliver a reliable, user-friendly, and cost-effective online agriculture product store within the given time and budget.

12. The Committee of Mr. Henry, Mr Pandu, and Mr Dooku discussed with Mr Karthik and finalised on the V Model approach (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT) Mr Vandanam is mapped as a PM to this project. He studies this Project and Prepares a Gantt chart with V Model (RG, RA, Design, D1, T1, D2, T2, D3, T3, D4, T4 and UAT) as development process and the Resources are PM, BA, Java Developers, testers, DB Admin, NW Admin

Ans: **High-Level Gantt Chart (Textual Representation**

Phase	Duration (example)	Resources
RG – Requirement Gathering	Month 1	PM, BA, Stakeholders
RA – Requirement Analysis	Month 2	PM, BA, DB Admin, NW Admin
Design	Month 3–4	PM, BA, Java Devs, DB Admin, NW Admin
D1 + T1	Month 5–6	Java Devs, Testers
D2 + T2	Month 7–8	Java Devs, Testers
D3 + T3	Month 9–11	Java Devs, Testers, DB Admin, NW Admin
D4 + T4	Month 12–14	Java Devs, Testers, DB Admin, NW Admin
UAT	Month 15–16	BA, PM, Testers, Stakeholders
Deployment & Handover	Month 17–18	All team

13.Explain the difference between Fixed Bid and Billing projects?

Ans:

Aspect:	Fixed Bid Project	Billing (Time & Material) Project
Definition:	Client and vendor agree on a fixed cost and scope before starting the project.	Client pays for the actual effort and time spent by the vendor's team (hourly/daily/monthly rate).
Scope:	Pre-defined and frozen; changes are costly (handled via Change Requests).	Flexible; scope can evolve and change dynamically during the project.
Risk:	Vendor bears high risk (if effort > estimated, vendor still delivers within agreed cost).	Client bears more risk (since cost depends on actual effort/time).
Budget:	Pre-approved lump sum (e.g., 2 Crores INR for this project).	Variable; final cost depends on actual hours/days billed.
Client Control:	Low – since client only sees milestones/deliverables.	High – client can monitor, adjust priorities, and add/remove features anytime.
Vendor Profitability:	Depends on accurate estimation & efficient execution.	More predictable revenue, but depends on available work and utilization.
Change Management:	Formal process – Change Request (CR) must be raised, renegotiated.	Easier to accommodate changes; cost just increases with effort.
Best Suited For:	Projects with clear, well-defined requirements and less chance of change (e.g., Government projects, CSR projects like Mr. Henry's).	Projects with evolving requirements where client wants flexibility (e.g., Agile product development)

14. Preparer Timesheets of a BA in various stages of SDLC

Design Timesheet of a BA

Development Timesheet of a BA

Testing Timesheet of a BA

UAT Timesheet of a BA

Deployment and Implementation Timesheet of a BA

Ans : <u>Design Phase – BA Timesheet:</u>

Activity	BA Role/Task	Estimated Effort (Hours/Week)
Requirement Gathering Workshops	Conduct meetings with farmers, committee, and SMEs	8–10
Requirement Analysis	Analyze and document functional & non-functional requirements	6–8
Use Case / User Story Creation	Create use cases, user stories, acceptance criteria	6
Requirement Traceability Matrix (RTM)	Prepare RTM for mapping requirements to design	4
Review Sessions	Validate requirements with stakeholders	4
Total Weekly Effort	28–32 hrs	

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2. Development Phase – BA Timesheet

Activity	BA Role/Task	Estimated Effort (Hours/Week)
Clarifications to Dev Team	Answer requirement-related queries	6–8
Change Requests	Document and manage CRs	4
Requirement Traceability Updates	Maintain RTM with design & dev progress	4
Review of Technical Design Docs	Ensure alignment with requirements	3–4
Stand-up / Scrum Meetings	Participate in Agile ceremonies	3
Total Weekly Effort	20–23 hrs	

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3. Testing Phase – BA Timesheet

Activity	BA Role/Task	Estimated Effort (Hours/Week)
Test Case Review	Validate test cases prepared by testers	6
Support Testing Team	Provide clarifications on requirements	6–8
Defect Analysis	Help triage defects & confirm requirement gaps	4–5

Activity	BA Role/Task	Estimated Effort (Hours/Week)
RTM Verification	Ensure test coverage for all requirements	4
Total Weekly Effort	20–23 hrs	

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4. UAT (User Acceptance Testing) Phase – BA Timesheet

Activity	BA Role/Task	Estimated Effort (Hours/Week)
UAT Planning	Assist committee (Mr. Henry, Pandu, Dooku, farmers) with UAT scope	4
UAT Scenarios & Scripts	Prepare/review UAT test cases	6
UAT Execution Support	Guide farmers & stakeholders during UAT	6–8
Defect Logging/Resolution	Document issues & help prioritize fixes	4
Sign-off Documentation	Collect UAT approval	2
Total Weekly Effort	20–24 hrs	

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5. Deployment & Implementation Phase – BA Timesheet

Activity	BA Role/Task	Estimated Effort (Hours/Week)
Release Planning	Assist PM in deployment readiness	3
Training	Conduct training for farmers & company staff	6–8
User Manuals	Prepare user guide, FAQs, help documents	6
Post-Go-Live Support	Help resolve initial adoption issues	6
Feedback Collection	Gather feedback for future improvements	4
Total Weekly Effort	25–27 hrs	