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Question 1 – BPM - 5 Marks

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

Business Process Model for Online Agriculture Store

Goal

The goal of this online agriculture store is to facilitate farmers in remote areas to buy agricultural products (fertilizers, seeds, pesticides) easily through an online platform, connecting them directly with manufacturers.

Inputs

Requirements collected from farmers (Peter, Kevin, Ben).
Product details from manufacturers (fertilizers, seeds, pesticides).
Funding of 2 Crores INR under CSR initiative from SOONY Company.
18-month timeline for project completion.

Development team Resources

Technology: Online web & mobile application, database, cloud infrastructure, and secure payment gateways.
Human Resources:
SOONY Company Committee: Mr. Henry, Mr. Pandu, and Mr. Dooku.
Stakeholders: Farmers like Peter, Kevin, and Ben.
APT IT SOLUTIONS team: Project Managers, Developers (Java), Testers, DB Admins, and Network Admins.
Manufacturers: Suppliers of fertilizers, seeds, and pesticides.
Logistics & Delivery Services: Ensuring product delivery to farmers' locations.

Outputs

Fully developed online agriculture store that allows:
Manufacturers to upload product details.
Farmers browse and purchase agricultural products.
Payment & Delivery system integrated for seamless transactions.
Improved supply chain for farmers to procure essential agricultural goods.

Activities (Processes)

Requirement Gathering: Farmers share challenges; manufacturers provide product details.
Development Phase: Design & coding of online platform by APT IT SOLUTIONS.
Testing: Ensuring platform usability, security, and efficiency.
Launch & Deployment: Making platform available to farmers & manufacturers.
Marketing & User Onboarding: Training farmers on how to use the platform.
Order Processing & Delivery: Farmers place orders, manufacturers fulfill them.
Customer Support & Feedback: Resolving issues and improving the platform.
Value Created for End Customers (Farmers)
Easy Access: Farmers in remote areas can buy essential agricultural products without middlemen. Direct Manufacturer-Farmer Communication: Ensures quality products at competitive rates. Convenience & Efficiency: Online orders and home delivery save time. Improved Productivity: Access to fertilizers, seeds, and pesticides improves farming yield.

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This model ensures a seamless experience for farmers and manufacturers while solving critical agricultural supply challenges.

Question 2 – SWOT - 5 Marks

Strengths (Internal, Positive)	**Weaknesses (Internal, Negative)**
Direct Access for Farmers	Adoption Challenges
CSR Initiative & Funding	Dependency on Internet Connectivity
Strong Technical Team	Logistical Issues
User-Friendly Interface	Limited Initial Product Availability
Enhanced Agricultural Productivity	Security & Fraud Risks
Scalability	

Opportunities (External, Positive)	**Threats (External, Negative)**
Market Expansion	Competition from Existing Market Players
Government Partnerships	Regulatory & Compliance Issues
Mobile App Integration	Economic Uncertainty
Sustainable Agriculture Initiatives	Manufacturer Reliability
AI-Based Recommendations	Cybersecurity Risks

Question 3 – Feasibility study - 5 Marks

Aspect	**Details**	**Risks**
Technical Feasibility	- Platform development using Java, cloud, databases, payment gateways - Needs stable internet or offline support for rural farmers - Requires cybersecurity and scalability planning	- Digital literacy gap among farmers requiring training

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Economic Feasibility	- Budget of ₹2 Cr from SOONY (CSR-funded) - Revenue from commissions, ads, premium subscriptions - Low-cost delivery models needed	- Slower adoption could delay financial viability
Market Feasibility	- High demand for fertilizers, seeds, pesticides access - Direct manufacturer-farmer collaboration - Value through transparency and convenience	- Competition from other agri-eCommerce platforms
Operational Feasibility	- Commitment from SOONY, farmers, and APT IT SOLUTIONS - Skilled team already available - Needs cloud, payments, order tracking systems	- Logistics in remote areas might pose challenges
Legal Feasibility	- Must comply with agro-regulations for input products - Ensure compliance with data security and privacy laws	- Regulatory changes could disrupt operations

Question 4 – Gap Analysis - 5 Marks

Gap Analysis for Online Agriculture Store Project

Introduction to Gap Analysis

A gap analysis identifies the differences between current state (where farmers struggle to access fertilizers, seeds, and pesticides) and desired state (where the online store provides an efficient supply chain for farmers).

Current State (Existing Challenges)

Limited Access: Farmers face difficulties in procuring fertilizers, seeds, and pesticides. Remote Location Issues: Many farmers lack easy access to markets due to distance and transportation constraints.
High Costs & Middlemen: Farmers rely on intermediaries who increase prices for agricultural products.
Technology Barriers: Low digital literacy and unstable internet connectivity in rural areas.
Logistics Challenges: Lack of reliable delivery systems for farm supplies.
Limited Manufacturer-Farmer Interaction: Farmers often struggle to connect with suppliers directly.

Desired State (Goals of the Online Agriculture Store)

Efficient Supply Chain: Farmers can buy fertilizers, seeds, and pesticides online from manufacturers.
Direct Manufacturer-Farmer Communication: No middlemen, leading to fair pricing and transparency.
User-Friendly Online Platform: Accessible web & mobile application designed for farmers.
Secure Payments & Order Tracking: Reliable e-commerce functionalities with delivery tracking.
Digital Training & Support: Providing education for farmers to adopt online purchasing.
Effective Logistics Management: Ensuring seamless delivery to rural areas.

Question 5 – Risk Analysis - 10 Marks

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Risk Analysis for Online Agriculture Store Project
A risk analysis identifies potential threats to project success and outlines strategies for mitigation.
Risk Identification
Technical Risks
System Downtime & Performance Issues – The online platform must be highly available and capable of handling farmer traffic.
Cybersecurity Threats – Risks of data breaches, hacking, and fraudulent transactions.
Compatibility Issues – Ensuring that farmers using basic mobile devices can access the platform seamlessly.
Financial Risks
Budget Overruns – ₹2 Crore INR may need adjustments if unforeseen costs arise. Adoption Rate Uncertainty – Slow farmer adoption could delay returns, affecting long-term sustainability. Pricing Fluctuations – Market instability could affect costs for fertilizers, seeds, and pesticides.

Operational Risks
Farmer Digital Literacy – Many farmers may struggle with navigating online platforms.
Logistics Challenges – Delivering products efficiently to remote locations could be difficult.
Manufacturer Reliability – Manufacturers may face production delays or price changes.

Legal & Compliance Risks
Regulatory Approvals – Agricultural product sales must comply with government standards.
Data Privacy Laws – The platform must adhere to local cybersecurity and data protection regulations.

Risk Mitigation Strategies
Robust IT Infrastructure – Ensure reliable cloud hosting, real-time monitoring, and backup systems.
Cybersecurity Measures – Implement encryption, fraud detection, and multi-factor authentication for transactions.
Farmer Training & Support – Conduct digital literacy workshops and offer multi-language customer support.
Strategic Logistics Partnerships – Collaborate with delivery services specializing in rural areas.
Flexible Budget Planning – Allocate contingency funds for unexpected costs.
Strong Manufacturer Vetting – Partner with reliable suppliers with a history of timely delivery.
Legal Compliance Monitoring – Work with regulatory experts to ensure adherence to agricultural and data privacy laws.

Question 6 – Stakeholder Analysis (RACI Matrix) - 8 Marks]

RACI Matrix for Online Agriculture Store Project

Task/Activity	**Responsible (R)**	**Accountable (A)**	**Consulted (C)**	**Informed (I)**

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Requirement Gathering	Business Analyst, Stakeholders (Peter, Kevin, Ben)	Project Manager (Mr. Vandanam)	SOONY Committee, Mr. Henry	Development Team, APT IT SOLUTIONS
Budget Allocation & Approval	SOONY Committee (Mr. Pandu, Mr. Dooku)	Mr. Henry	Financial Head (Mr. Pandu)	Project Manager, Development Team
Platform Design & Development	Development Team (Juhi, Teyson, Lucie, Tucker, Bravo)	Project Manager (Mr. Vandanam)	Business Analyst, Network Admin (Mr. Mike), DB Admin (John)	SOONY Committee, Mr. Henry
Testing & Quality Assurance	Testers (Mr. Jason, Ms. Alekya)	Project Manager (Mr. Vandanam)	Business Analyst, Developers	SOONY Committee
Deployment & Implementation	Network Admin (Mr. Mike), DB Admin (John)	Delivery Head (Mr. Karthik)	Developers, Testers	SOONY Committee, Farmers
Marketing & Farmer Training	Business Analyst, SOONY Committee	Mr. Henry	Project Manager, Stakeholders	Development Team
Order Management & Logistics	Farmers, Manufacturers	SOONY Committee	Logistics Partners	Project Manager
Customer Support & Feedback	Support Team	Project Manager	Business Analyst	Farmers, Manufacturers

Question 7 – Business Case Document - 8 Marks
Why is the project initiated?
Who is initiating the project?
With this project how many problems can be solved?
Who is responsible for the project development?
What will be the benefit of this project development?
What will be the timeframe?
How to identify stakeholders?

Question 8 – Four SDLC Methodologies - 8 Marks
Four SDLC (Software Development Life Cycle) Methodologies

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The Software Development Life Cycle (SDLC) defines a structured approach to developing software, ensuring efficiency, reliability, and scalability. Below are four key methodologies used in SDLC:

Waterfall Model
Approach: Linear and sequential process, where each phase must be completed before moving to the next. Phases:
Requirements Gathering
System Design
Implementation (Coding)
Testing
Deployment
Maintenance Advantages:
Simple and easy to manage.
Clear structure and documentation. Disadvantages:
No flexibility to accommodate changes once a phase is completed.
Late testing may reveal issues that are difficult to fix.

Agile Model
Approach: Iterative and incremental development, emphasizing continuous delivery and customer collaboration. Phases:
Concept & Initiation
Iterative Development (Sprints)
Continuous Testing
Deployment & Feedback Advantages:
Highly adaptable to changes.
Faster delivery with ongoing feedback loops. Disadvantages:
Requires continuous collaboration and active user involvement.
More resource-intensive and complex to manage.

V-Model (Verification & Validation)
Approach: An extension of the Waterfall Model where testing occurs at each development stage.
Phases:
Requirement Analysis → Corresponding Unit Testing
System Design → Corresponding Integration Testing
Implementation → Corresponding System Testing
Deployment → Corresponding Acceptance Testing Advantages:
Early defect detection due to parallel testing.
Well-defined structure. Disadvantages:
Still follows a rigid Waterfall approach, limiting flexibility.
Costly if requirements change later in development.

Spiral Model
Approach: Risk-driven, iterative development emphasizing prototypes before full-scale implementation.
Phases (Repeated for Each Iteration):

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Planning & Risk Analysis
Prototype & Initial Development
Testing & Review
Full Deployment & Maintenance Advantages:
Good for complex projects with high uncertainty.
Allows gradual improvements and feedback incorporation. Disadvantages:
Requires thorough risk assessment and documentation.
Can be expensive compared to simpler models.

Question 9 – Waterfall RUP Spiral and Scrum Models – 8 Marks

Comparison of Waterfall, RUP, Spiral, and Scrum SDLC Models

Waterfall Model
Approach: A linear, sequential development process where each phase must be completed before moving to the next. Phases:
Requirement Analysis
System Design
Implementation (Coding)
Testing
Deployment
Maintenance
Advantages:
Simple and easy to follow.
Well-documented process with clear milestones.
Disadvantages:
No flexibility once a phase is completed.
Late testing may reveal critical flaws that are difficult to fix.
Best For: Projects with well-defined requirements and minimal expected changes.

Rational Unified Process (RUP)Approach: A structured iterative development method that divides software development into four key phases. Phases:
Inception (Requirement analysis, feasibility study)
Elaboration (Architecture design, risk assessment)
Construction (Development, coding, integration)
Transition (Testing, deployment, user training)
Advantages:
Focuses on risk management early in the project.
Incorporates iterative development, allowing continuous refinement.
Disadvantages:
Complex structure requires thorough planning.
Can be resource-intensive in terms of documentation and management.
Best For: Large-scale projects that require high adaptability and structured risk management.

Spiral Model

Approach: Focuses on risk-driven, iterative development through multiple cycles. Phases (Repeated for Each Iteration):
Planning & Risk Analysis
Prototype Development
Testing & Feedback
Full Deployment & Maintenance
Advantages:
Allows continuous improvement by identifying risks early.
Suitable for complex projects with evolving requirements.
Disadvantages:
Requires extensive risk analysis and documentation.
Can be expensive due to repeated cycles.
Best For: High-risk projects where requirements are uncertain or evolving.

Scrum Model (Agile Methodology) Approach: An Agile-based iterative framework emphasizing flexibility, collaboration, and rapid development. Phases:
Execution (Development in time-boxed intervals)
Sprint Review & Retrospective (Evaluation & improvement)
Advantages:
Encourages continuous stakeholder involvement.
Quickly adapts to changes with incremental updates.
Disadvantages:
Requires high team coordination and user involvement.
Difficult to implement in large-scale rigid environments.
Best For: Dynamic, fast-paced projects requiring frequent revisions and real-time feedback.
Which Model is Best for the Online Agriculture Store?
Given the project's stakeholder involvement, ongoing adjustments, and long-term evolution, the best models would be: Scrum (Agile) – Ideal for rapid feature development and continuous farmer feedback integration.
Spiral Model – Suitable if risk evaluation needs to be integrated at every stage before large-scale deployment.

Question 10 – Waterfall Vs V-Model - 5 Marks

Comparison: Waterfall vs V-Model

Aspect	**Waterfall Model**	**V-Model (Verification & Validation)**
Approach	Linear and sequential	Testing is integrated in every development phase

Phases	Requirement → Design → Coding → Testing → Deployment → Maintenance	Requirement ↔ Unit Testing , Design ↔ Integration Testing , Implementation ↔ System Testing , Deployment ↔ Acceptance Testing
Advantages	- Simple and structured - Easy to manage - Good for stable requirements	- Early defect detection - Continuous validation - Cost-effective bug resolution
Disadvantages	- Rigid and inflexible - Late testing - Not ideal for evolving projects	- Still rigid - Limited adaptability for iterative development
Best For	Projects with fixed requirements and minimal change	Critical systems needing high assurance and validation
Flexibility	Low	Low (but better than Waterfall for error detection)
Testing Approach	Testing after coding	Testing at every development stage
Risk Handling	Risks often detected late	Risks addressed early through validation
Adaptability	Poor	Slightly better due to structured validation

Question 11 – Justify your choice - 3 Marks

Considering the dynamic nature of an e-commerce platform for farmers, the Waterfall Model may not be suitable due to its rigid structure. The V-Model is slightly better, but an Agile-based approach (Scrum or Spiral) would be even more effective for continuous updates and feedback integration.

Question 12 – Gantt Chart - 5 Marks

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Month → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Initiation █ █

Requirements █ █

Design █ █

Dev (Java) █ █ █ █ █ █

DB & Network █ █ █ █ █

Testing █ █

Deployment █ █

Marketing █ █

Maintenance █ →

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Each "█" block represents task duration by month, and the arrow (→) indicates ongoing support beyond Month 18.

| Task/Phase | Responsible | Start Date | End Date | Duration |
|---|---|---|---|---|
| Project Initiation & Planning | Mr. Henry, SOONY Committee, BA | Month 1 | Month 2 | 2 Months |
| Requirement Gathering & Analysis | BA, Farmers (Peter, Kevin, Ben) | Month 3 | Month 4 | 2 Months |
| System Design & Architecture | Project Manager, Developers | Month 5 | Month 6 | 2 Months |
| Platform Development (Front-End & Back-End) | Developers (Java Team) | Month 7 | Month 12 | 6 Months |
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Database & Network Setup	DB Admin (John), Network Admin (Mike)	Month 8	Month 12	5 Months
Testing & Quality Assurance	Testers (Jason, Alekya)	Month 13	Month 14	2 Months
Deployment & Launch	Delivery Head (Karthik), IT Admins	Month 15	Month 16	2 Months
Marketing & Farmer Onboarding	BA, SOONY Committee	Month 16	Month 17	2 Months
Maintenance & Support	Development Team, Admins	Month 18	Ongoing	Continuous

Question 13 – Fixed Bid Vs Billing - 5 Marks

Aspect	**Fixed Bid Model**	**Billing (Time & Material) Model**
Definition	Predefined cost based on scope and deliverables	Pay-as-you-go based on actual time and resource usage
Best For	- Well-defined requirements - Minimal scope changes - Budget-sensitive projects	- Evolving requirements - Agile development - Projects with expected changes
Advantages	- Fixed cost & predictable budget - Clear deliverables - Lower client risk	- High flexibility - Better quality through iteration - Enhanced collaboration
Disadvantages	- Limited flexibility - Expensive scope changes - Quality may drop under fixed constraints	- Budget uncertainty - Risk of scope creep - Requires active client engagement

Suitability for Online Agriculture Store	Suitable if scope and features are fully defined upfront	Preferable for dynamic changes, scalability, and ongoing feedback

Question 14 – Preparer Timesheets of a BA in various stages of SDLC - 20 marks

Design Phase Timesheet (80 hrs)

Task	**Estimated Hours**	**Description**
Requirement Gathering	20 hrs	Meetings with stakeholders to collect business needs
Business Process Modeling	15 hrs	Mapping workflows, defining business rules
Functional Specification	25 hrs	Writing functional and system requirements
Wireframe Reviews	10 hrs	Reviewing UI/UX wireframes
Stakeholder Feedback & Refinement	10 hrs	Refining documents based on stakeholder input

Development Phase Timesheet (65 hrs)

Task	**Estimated Hours**	**Description**
Requirements Clarification	15 hrs	Helping devs understand business logic
User Story Creation	20 hrs	Writing Agile-friendly user stories
Sprint Planning Participation	10 hrs	Collaborating on backlog prioritization
Review of Development Progress	10 hrs	Ensuring alignment with business goals
Risk & Change Management	10 hrs	Assessing changes and managing impacts

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Testing Phase Timesheet (60 hrs)

Task	Estimated Hours	Description
Test Case Review	15 hrs	Validating test cases
UAT Criteria Definition	10 hrs	Defining acceptance parameters
Defect Triage & Analysis	15 hrs	Classifying and analyzing bugs
Requirement Traceability	10 hrs	Mapping features to requirements
Regression Testing Coordination	10 hrs	Managing retests for changed code

UAT Phase Timesheet (70 hrs)

Task	Estimated Hours	Description
Training & User Guidance	20 hrs	Educating users on new functionality
UAT Test Execution Support	15 hrs	Supporting workflow validation
User Feedback Collection	15 hrs	Gathering stakeholder insights
Bug Fix Validation	10 hrs	Confirming bug resolution
Final Documentation	10 hrs	Updating requirement docs

Deployment & Implementation Timesheet (60 hrs)

Task	Estimated Hours	Description
Go-Live Checklist Review	15 hrs	Ensuring deployment readiness
Production Support Planning	10 hrs	Monitoring and issue response planning
Data Migration Validation	15 hrs	Verifying migrated data
Stakeholder Communication	15 hrs	Keeping stakeholders informed
Post-Deployment Analysis	10 hrs	Assessing business impact

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