**Question 1 – BPM - 5 Marks**

**Goal**: To develop an online agriculture product store that enables farmers to purchase agricultural products (fertilizers, seeds, pesticides) directly from manufacturers, to facilitate remote area farmers.
**Input**:

1. Requirements: Functional and non-functional requirements from stakeholders (farmers, manufacturers, and committee).
2. Products: Fertilizers, seeds, and pesticides information provided by manufacturers.
3. Budget: INR 2 Crores.
4. Duration: 18 months.

**Resources:**

* Mr Henry Company SOONY

Mr.Henry Committee member

Mr.Pandu Financial head, Committee member

Mr.Dooku Project coordinator, Committee member

* APT IT SOLUTIONS company

 Mr.Peter stakeholder

 Mr.Kevin stakeholder

 Mr.Ben stakeholder

 Mr. Karthik Delivery head

 Mr. Vandanam project Manager

 Ms. Juhi Senior Java Developer,

 Mr. Teyson Java Developers

 Ms. Lucie Java Developers

 Mr. Tucker Java Developers

 Mr. Bravo Java Developers

 Mr. Mike Network Admin

 Mr. John DB Admin

 Mr. Jason Tester

 Ms. Alekya Tester

 you as a BA.

Technical Resources:

 Frameworks for development (e.g., Java).

 Cloud hosting platforms to scale-up

 Tools for testing JIRA, UI/UX design Adobe , and database management SQL.

Infrastructure:

 Servers for hosting the application.

 Payment gateway integrations for transactions.

**Output:**

A functional online agriculture product store accessible via web and mobile applications.

Features include product catalogs, user registration, secure transactions, and order tracking.

A user-friendly interface designed for farmers with limited technical expertise.

**Activities:**

**Value:**

 Reduces intermediaries, ensuring farmers get access to affordable and quality products.

 facilitate remote area farmers with technology and better access to resources.

 Creates a scalable platform for manufacturers to reach untouched markets

Promotes better agricultural practices by providing easy access to necessary farming inputs

**Question 2 – SWOT - 5 Marks**

**Strengths**:

Solves a real problem for farmers.

Strong financial backing (₹2 Crores).

 Skilled development team.

Positive social impact through CSR.

**Weaknesses:**

Digital literacy barriers for farmers.

Internet and smartphone limitations in rural areas.

Dependence on manufacturers for product supply.

Delivery challenges in remote areas.

**Opportunities**:

Large untapped rural market.

Potential government partnerships.

Growing technology adoption in rural areas.

Future expansion to other agricultural products.

**Threats**:

Competition from established e-commerce platforms.

Connectivity issues in rural areas.

Resistance to digital adoption by farmers.

Regulatory and operational risks.

**Question 3 – Feasibility study - 5 Marks**

1. Technical Feasibility

Technology Availability:

Adequate talent pool with expertise in Java development, database management, and networking.

Resources for building web and mobile applications.

Secure payment gateways and cloud infrastructure are widely available.

Technical Challenges:

Ensuring the platform works effectively in low-bandwidth rural areas.

Developing a simple, intuitive interface for farmers with limited digital literacy.

2. Hardware

For Development and Deployment:

High-performance servers for hosting.

Developer workstations with adequate configurations.

For Farmers:

Smartphone (basic Android/iOS compatibility).

3. Software

Development Tools:

IDEs

Project Management Tools (e.g., Jira)

Database Management:

MySQL/PostgreSQL for structured data.

Testing Tools:

Selenium, JUnit for automated testing.

**Resource**

Human Resources (**APT IT SOLUTIONS** team)

Logistics Partners - Delivery service providers to ensure product shipment to remote locations.

**Budget: ₹2 Crores**

Allocation:

Development & Testing: ₹1 Crore.

Infrastructure & Hosting: ₹50 Lakhs.

Marketing & Awareness: ₹30 Lakhs.

Training & Support: ₹20 Lakhs.

**Time Frame: 18 Months**

Breakdown:

Requirement Gathering: 2 months.

Design (UI/UX): 2 months.

Development: 8 months.

Testing: 3 months.

Deployment and Launch: 3 months.

**Question 4 – Gap Analysis - 5 Marks**

**1. Current State (As-Is)**

Farmers’ Challenges:

Difficulty in accessing essential agricultural products (fertilizers, seeds, pesticides) in remote areas.

Reliance on intermediaries leading to increased costs and delays.

Limited awareness of product options and availability.

Manufacturers’ Challenges:

Lack of direct access to a wider customer base (farmers).

Inefficiency in communicating product details to remote areas.

Dependency on traditional sales channels.

**2. Desired State (To-Be)**

Farmers’ Benefits:

Seamless online access to a wide range of agricultural products.

Ability to browse, compare, and order products directly from manufacturers.

Delivery services to remote locations, reducing time and effort.

Manufacturers’ Benefits:

Direct interaction with farmers via a centralized platform.

Increased product visibility and sales.

Simplified order processing and tracking.

**Question 5 – Risk Analysis - 10 Marks**

**Internal Risk**

Lack of skilled resources.

Budget overruns.

Poor communication among stakeholders or misunderstanding of the requirement.

Scope creep due to unclear requirements.

**External Risk**

Internet connectivity issues in rural areas.

Regulatory changes in agriculture or e-commerce as per government norm and condition.

transportation challenges in remote areas.

Resistance to technology adoption by people.

**BA Risk**

Incomplete or unclear requirements

Miscommunication between stakeholders

Failure to prioritize requirements

Insufficient domain knowledge

Lack of stakeholder buy-in

**Project Based risk**

Unrealistic timelines

Dependencies on external vendors

Quality issues in deliverables

Failure to meet user needs

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Task/Activity** | **Requirement Gathering** | **Platform Design (UI/UX)** | **Platform Development** | **Database Design and Management** | **Network Infrastructure Setup** | **Testing** |
| **Responsible (R)** | Business Analyst (BA) | UX/UI Designers | Java Developers, Senior Java Developer | DB Admin (John) | Network Admin (Mike) | Testers (Jason, Alekya) |
| **Accountable (A)** | Mr. Vandanam (PM) | Mr. Vandanam (PM) | Ms. Juhi (Sr. Developer) | Ms. Juhi (Sr. Developer) | Ms. Juhi (Sr. Developer) | Mr. Vandanam (PM) |
| **Consulted (C)** | Farmers (Peter, Kevin, Ben), Manufacturers | Farmers, Manufacturers | Business Analyst | Business Analyst | Business Analyst | Business Analyst |
| **Informed (I)** | Project Committee, Development Team | Development Team | Project Committee | Development Team | Development Team | Project Committee |

**Question 7 – Business Case Document - 8 Marks**

1. Why has this project been initiated?

This project was launched to solve the obstacles that farmers in remote places encounter while trying to obtain key agricultural products including fertilizers, seeds, and pesticides. The goal is to build an online platform that allows farmers and manufacturers to engage directly, thereby enhancing accessibility, lowering costs, and increasing efficiency in the agriculture supply chain.

2. What are the current issues?

In isolated places, there is limited access to fertilizers, seeds, and pesticides.

High costs owing to reliance on intermediaries.

A lack of knowledge about accessible items and their benefits.

Procurement methods are time-consuming and inefficient.

Manufacturers face challenges in reaching out directly to end customers (farmers).

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

Farmers will have direct access to a variety of agricultural products.

Manufacturers can promote their products and communicate with farmers directly.

Elimination of intermediaries results in cost savings for farmers.

Reduced logistical inefficiencies through improved delivery services.

Increased awareness and education about various products on the marketplace.

4.What are the resources required?

Human Resources:

The development team includes Java developers, senior Java developers, testers, network administrators, and database administrators.

Business analysts are responsible for obtaining requirements and communicating with stakeholders.

A project manager will be assigned to oversee the project.

UX/UI Designers are responsible for creating user-friendly platform designs.

Technological Resources:

Hardware for testing includes servers, cloud infrastructure, and mobile devices.

Software includes programming frameworks (such as Java), database systems, security tools, and collaborative tools.

Financial Resources:

The committee allocated a total budget of ₹2 crore INR.

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

Manufacturers will experience minimal organizational change because their primary responsibilities are to join the platform and manage product listings.

Farmers may require training and awareness sessions to effectively utilize the platform, so expect moderate change.

If there are no existing collaborations, the distribution and logistics system may require extensive setup.

6. What is the Time frame to recover ROI?

Depending on the pace of adoption by farmers and manufacturers, platform revenue generation from possible subscription fees or commissions, and total market penetration, the estimated ROI recovery time is three to five years.

7. How to identify stakeholders?

Primary Stakeholders:

Farmers (end-users) who will use the platform to procure products.

Manufacturers (product suppliers) who will list and sell products.

Secondary Stakeholders:

Logistics providers for delivery services.

Financial institutions for payment gateway integration.

Key Decision-Makers:

Mr. Henry (sponsor), Mr. Pandu (financial head), and Mr. Dooku (project coordinator).

Project committee overseeing budget and progress.

Project Team:

Development team, testers, and support staff.

**Question 8 – Four SDLC Methodologies - 8 Marks**

1. Waterfall Model - sequential

The Waterfall Model follows a linear and sequential approach, where each phase must be completed before the next begins.

Phases: Requirements → Design → Implementation → Testing → Deployment → Maintenance.

Advantages:

Simple and easy to understand.

Clear deliverables at each phase.

Ideal for projects with well-defined requirements.

Disadvantages:

Inflexible to changes once a phase is completed.

Not suitable for complex or evolving projects.

2. Agile Methodology

Agile emphasizes iterative development, collaboration, and adaptability to change.

Phases: Iterative cycles (Sprints) involving Planning → Development → Testing → Review → Deployment.

Advantages:

Highly adaptable to changes in requirements.

Encourages close collaboration with stakeholders.

Faster delivery of functional components.

Disadvantages:

Requires constant involvement from stakeholders.

Difficult to estimate time and costs accurately.

3. Scrum Framework

Scrum is an Agile framework focused on iterative development and team collaboration.

Phases: Sprint Planning → Daily Stand-ups → Sprint Development → Sprint Review → Sprint Retrospective.

Advantages:

Emphasizes teamwork and accountability.

Delivers usable features after every sprint.

Transparent progress tracking with tools like burndown charts.

Disadvantages:

Requires a dedicated Scrum Master and trained team.

Not ideal for projects with fixed deliverables or rigid timelines.

4. Evolutionary Spiral Model

It is an evolutionary software development approach that combines iterative development with systematic risk assessment. It emphasizes refinement through successive iterations (or spirals), addressing risks at each stage and gradually evolving the system.

Advantages:

Focus on early identification and mitigation of risks reduces project failure rates.

Adapts to evolving requirements, making it suitable for dynamic projects.

Regular user feedback ensures alignment with user expectations.

Each iteration adds value and builds towards the final system.

Disadvantages:

Requires expertise in risk analysis and management.

Iterative processes and risk assessments can increase project costs.

Frequent iterations and validations may extend project timelines.

Overhead may outweigh benefits for simple, low-risk projects.

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

**1. Waterfall Model**

The Waterfall Model is the traditional, linear approach to software development, where each phase must be completed before moving to the next one.

Phases: Requirements → Design → Implementation → Testing → Deployment → Maintenance

Advantages:

Easy to understand and manage.

Suitable for projects with clear, fixed requirements.

Easy to track progress with structured stages.

Disadvantages:

Inflexible; changes are difficult to implement after the project has started.

Testing happens only after development is done, which makes early problem detection hard.

Not suitable for complex or changing projects.

Best For:

Projects with well-defined, non-changing requirements.

Smaller projects with a limited scope or those that involve standard technology.

**2. Rational Unified Process (RUP)**

RUP is an iterative, risk-driven development model that focuses on structured workflows and continuous refinement of the system.

Phases: Inception → Elaboration → Construction → Transition

Advantages:

Iterative approach helps in early risk identification.

Focus on use cases and architecture ensures system reliability.

Regular stakeholder feedback and quality assurance.

Disadvantages:

Can be resource-heavy in terms of documentation and process management.

Requires experienced teams and detailed planning.

May be overkill for small projects.

Best For:

Large-scale, complex projects requiring a detailed, structured approach.

Projects with significant risk and need for high-quality architectural planning.

**3. Spiral Model**

The Spiral Model is an evolutionary approach, which combines iterative development with risk assessment and management.

Phases: Objective Setting → Risk Assessment → Development and Validation → Review and Planning

Advantages:

Risk management is a strong focus for proactive problem-solving.

Flexible and adaptive to changes in requirements.

Regular user feedback ensures the system is on track.

Disadvantages:

The repetitive nature of the phases makes it time-consuming and costly.

Requires skilled resources for risk management and continuous review.

Complexity might not be needed for straightforward projects.

Best for:

High-risk, large and complex projects with critical need of risk management

Projects whose requirements are likely to change or those whose results may not be clear.

**4. Scrum Model**

Scrum is an Agile framework that places emphasis on collaboration, teamwork and iterative development, and concentrates on the frequent delivery of small, working parts of software.

Steps: Sprint Planning → Daily Stand-ups → Sprint → Sprint Review → Sprint Retrospective

Advantages:

Adaptability to Change in Requirements High

Frequent Releases of Workable Software With High Value Provided to Stakeholders

Promote Cross-Functional Teams

Disadvantages:

Highly devoted team and seasoned Scrum Master are needed

Projects with requirements are not flexible

Projects with immovable timelines may not be applicable

Stakeholders' ongoing involvement can be challenging

Best for:

Agile-experience teams

Those who have work experience in Agile environments.

**Question 10 – Waterfall Vs V-Model - 5 Marks**

**Waterfall Model**

Approach: Linear and sequential, where each phase is completed before moving to the next.

Phases: Requirements → Design → Implementation → Testing → Deployment → Maintenance.

Advantages:

Simple and easy to understand.

Well-suited for small, well-defined projects.

Easy to track progress with structured stages.

Low cost project.

Disadvantages:

Inflexible to changes once development starts.

Testing is only done after development.

It harder to identify issues early.

Not suitable for complex or changing projects.

**V-Model (Verification and Validation Model)**

Approach: An extension of the Waterfall model with a focus on verification and validation, where each development phase is directly associated with a testing phase.

Phases: Requirements → System Design → Architecture Design → Module Design → Coding → Unit Testing → Integration Testing → System Testing → Acceptance Testing.

Advantages:

Early testing ensures issues are detected early.

Structured approach with clear testing activities for each development phase.

Good expensive project.

Easy to manage.

Disadvantages:

Still rigid like Waterfall changes are difficult once the project progresses.

Can be inefficient for large, complex projects with evolving requirements.

Requires detailed documentation at each stage, which can be time-consuming and burdensome, especially in the case of complex systems.

Best suitable for projects where requirements may evolve over time

**Question 11 – Justify your choice - 3 Marks**

Agile Scrum will work well on this project, providing continuous delivery of a user-centric, functioning product with flexible agility to make it adaptable enough in response to stakeholders' views and changing needs while maximizing its opportunities for successful accomplishment within budgeted and allotted timelines.

1. **Frequent Iterations and Deliverables**
2. Agile Scrum ensures adaptability, and a user-friendly product within budget and time.
3. Regular feedback from Mr. Henry, farmers, and manufacturers ensures alignment with expectations
4. Early issue identification and resolution through incremental development

**Question 12 – Gantt Chart - 5 Marks**



**Question 13 – Fixed Bid Vs Billing - 5 Marks**

Fixed Bid Model

Cost is fixed and agreed upon upfront.

Low flexibility; scope cannot easily change.

Vendor assumes project risks.

Ideal for small, well-defined projects.

Billing (Time & Material) Model

Cost depends on hours worked and resources used.

High flexibility; scope can evolve during the project.

Risk is shared between client and vendor.

Ideal for complex, dynamic, or long-term projects.

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

|  |  |  |
| --- | --- | --- |
| **SDLC Stage** | **Task** | **Estimated Hours** |
| **1. Requirement Analysis** |   |   |
| - Stakeholder Meetings | Arrange workshops to gather requirements | 15-20 hrs/week |
| - Documentation | Create BRD, SRS, use cases | 10-15 hrs/week |
| - Validation | Signed-off requirements with stakeholders | 5-10 hrs/week |
| **2. System Design** |   |   |
| - Collaboration | Assist architects with functional design | 10-15 hrs/week |
| - Wireframing | Design wireframes or prototypes | 5-10 hrs/week |
| - Review | Validate design meets requirements | 5-10 hrs/week |
| **3. Development** |   |   |
| - Requirement Clarification | Walkthrough session to DEV+QA+IE | 5-10 hrs/week |
| - Backlog Grooming | Update and prioritize backlog | 5 hrs/week |
| - Support | Confirm requirement against requirements | 5 hrs/week |
| **4. Testing** |   |   |
| - Test Case Review | Validate test cases with QA team | 5-10 hrs/week |
| - UAT Coordination | Plan and monitor User Acceptance Testing | 10-15 hrs/week |
| - Issue Resolution | Clarify defects related to requirements | 5-10 hrs/week |
| **5. Deployment** |   |   |
| - Go-live Support | Ensure smooth rollout | 10-15 hrs/week |
| - Post-deployment Feedback | Collect feedback from users/stackholders | 5-10 hrs/week |
| **6. Maintenance** |   |   |
| - Change Requests | Document and manage new requirements | 10-15 hrs/week |
| - Continuous Support | Assist in ongoing issue resolution | 5-10 hrs/week |