**SECTION A (1)**

1. An Information System (IS) is a structured system that collects, processes, stores, and distributes information to support decision-making, coordination, control, analysis, and visualization in an organization.

**Main Components of IS in Green Agri**

**Hardware:** Servers, cloud infrastructure, and devices used to operate the IS.

**Software:** Includes the Transaction Processing System (TPS) for inventory management and Decision Support System (DSS) for crop yield forecasting.

**Data:** Customer trends, inventory data, and predictive analytics outputs.

**People:** Employees managing the IS, decision-makers using analytics, and farmers using insights.

**Processes:** Workflows for inventory tracking, crop yield forecasting, and demand prediction.

**Networks:** Cloud-based platforms ensuring centralized and scalable operations.

1. The value chain model identifies primary and support activities in an organization that add value to products or services . IS enhances Green Agri’s competitive advantage in the following ways .

**Inbound Logistics:**

* The **Transaction Processing System (TPS)** streamlines procurement and inventory management, ensuring eco-friendly products are sourced and stocked efficiently, reducing costs and waste.

**Operations:**

* The **Decision Support System (DSS)** aids in crop yield forecasting, allowing better planning and allocation of resources, which increases productivity and reduces downtime.

**Outbound Logistics:**

* The **cloud-based platform** centralizes operations, enabling faster and more reliable distribution of products to customers and regional warehouses.

**Marketing and Sales:**

* **Big Data analytics** monitor customer trends and predict demand, enabling personalized marketing strategies and timely product launches, boosting sales.

**Customer Service:**

* Enhanced IS ensures better communication with customers, offering timely updates, efficient problem resolution, and improved service quality, leading to greater customer satisfaction.

2. Transaction Processing System (TPS) are designed to handle and record day-to day operational transaction. They focus on processing large volumes of routine transactions efficiently and accurately.

Decision Support Systems (DSS) are used to analyze data and provide support for decision making in situation that are more complex and les structured . They help in making informed decisions based on data analysis.

**FUNCTIONALITY**

**TPS**  records and processes transactions, ensuring that information is accurate and up to date. It deals with transactional data like orders, inventory updates, and customer purchases.

**DSS** analyzes large datasets and provides insights to help decision makers in uncertain or complex scenarios, such as forecasting or trend analysis

**EXAMPLE FOR GREEN AGRI**

**TPS** , Green Agri uses TPS for  **INVENTORY MANAGEMENT .** The system tracks stock levels, manages orders, and updates the database in real-time, ensuring that inventory data is accurate and accessibla for day-to-day operations.

**DSS**, GreenAgri utilizes DSS for **CROP YIELD FORECASTING .** The system analyzes historical crop data, weather patterns, and other variables to predict future crop yields, helping decision-making plan for upcoming seasons.

1. Cloud computing plays a central role in **GreenAgri's information system (IS)** by enabling the company to centralize and streamline its operations across multiple regions

**Advantage of Cloud Computing:**

**Scalability and Flexibility:** Cloud computing enables GreenAgri to quickly scale operations to meet increasing demand, without having to invest in costly physical infrastructure. This flexibility allows the company to adapt to market changes and grow efficiently.

**Disadvantage of Cloud Computing:**

**Data Security and Privacy Risks:** While cloud services provide convenience and scalability, they also introduce security concerns, particularly with sensitive customer and operational data. GreenAgri must implement robust security measures to protect data from breaches and comply with regulations like the **General Data Protection Regulation (GDPR)**.

1. **DATA GOVERNANCE** refers to the management of data availability , usability, integrity, and security within an organization .

**INPORTANCE OF DATA GOVERNANCE IN GREEN AGRI’S IS**

**Ensure Data Quality And Consistency**

By establishing rules and processes for data entry , validation, and updating, GreenAgri can maintain consistent, high-quality data across its systems, reducing errors and improving decision-making accuracy.

**Protect Data Security and Privacy:**  
Data governance establishes policies for secure access to sensitive data, protecting it from breaches and unauthorized access. This is crucial for protecting GreenAgri’s customer information and operational data.

**Impact of GDPR on GreenAgri’s Data Management Practices**

 **Data Minimization and Purpose Limitation:**  
GreenAgri must ensure that only necessary personal data is collected and that data is used solely for the purposes for which it was collected, such as customer profiling for marketing or order processing.

 **Consent Management:**  
GreenAgri needs to obtain explicit consent from customers to process their personal data, ensuring that the customers are fully informed about how their data will be used.

 **Data Protection and Security:**  
GDPR mandates the implementation of security measures like encryption and access controls to protect personal data. GreenAgri must have systems in place to prevent unauthorized access and data breaches.

 **Data Subject Rights:**  
GreenAgri must respect customer rights, such as the right to access, rectify, and delete their personal data. The company must have processes for managing such requests efficiently.

 **Cross-Border Data Transfers:**  
Since GreenAgri operates in multiple regions, including the EU, it must ensure that any transfer of personal data across borders complies with GDPR's regulations on cross-border data transfers, possibly involving additional safeguards.

**(F) System** Development Life Cycle (SDLC) is a framework for developing, implementing, and maintaining information systems.

**GreenAgri’s Transformation:**

**Planning:** Identified goals for efficiency and competitiveness.

**Analysis:** Assessed existing systems and user needs.

**Design:** Created system architecture integrating TPS, DSS, and cloud solutions.

**Implementation:** Deployed IS and trained employees.

**Maintenance:** Continuously monitored and updated the system.

**(B)** E-commerce platforms like **GreenAgri's online store** can derive significant advantages from **Big Data and analytics** by leveraging vast amounts of data to gain insights into customer behavior, market trends, and operational performance.

**Benefit from Big Data and analytics**

**MONITORING CUSTOMER TRENDS**  GreenAgri uses Big Data analytics to track and analyze customer purchasing patterns.

**Benefit:** This insight allows GreenAgri to tailor its inventory and marketing strategies. For instance, if data reveals that customers are increasingly purchasing organic fertilizers, the company can ensure that this product is readily available, allocate resources for better stock management, and create targeted marketing campaigns that appeal to eco-conscious consumers.

**PREDICTING DEMAND FOR ECO-FRIENDLY PRODUCTS**

GreenAgri uses **predictive analytics** to forecast the demand for eco-friendly agricultural products based on historical data, seasonal patterns, weather forecasts, and market trends.

**Benefit:**  Big Data allows GreenAgri to predict when specific products will be in higher demand, enabling the company to optimize inventory and production levels. For example, by analyzing past years’ data and forecasting trends for the upcoming season, GreenAgri can adjust its supply chain to ensure product availability during peak demand periods, avoiding both overstocking and stockouts.

**(H)** **Challenges:**

1. **Transparency:** Lack of clarity in AI algorithms may cause distrust among stakeholders.
2. **Bias:** AI models may reinforce existing biases in customer profiling or marketing strategies.

**Solutions:**

1. **Promote Transparency:** Implement explainable AI (XAI) to ensure stakeholders understand AI-driven decisions.
2. **Mitigate Bias:** Regularly audit AI models and train them on diverse datasets to minimize biases.
3. **Ethical Guidelines:** Develop and enforce ethical AI policies to align with organizational values and customer trust.

**SECTION A (2)**

* 1. 1. Operational / Transactional Systems

Operational or transactional systems are necessary for performing transactions on a daily basis, which is many in volume and are of routine nature in any business. These systems emphasize on the processing of a transaction and are mainly used for recording the regular activities.

Example Applications in Centenary Bank:

Core Banking System: This is the other system that Centenary Bank uses as its core transactional system to conduct the daily banking such as making deposits and withdrawals, managing accounts, processing loans, and transferring funds. This system deals with customer’s transactions processing in real time.

ATM Management System: A system that handles transactions like ATM withdrawals, balance checks, and transfers. It guarantees that transactions are completed in real time and that the true accounts have been recorded.

2. Systems of Analyses

The aim of analytical systems is to analyze information and assist in decision making processes. These systems are geared towards data mining, profiling, and reporting for both strategic and tactical decision making processes.

**Example Applications in Centenary Bank:**

Customer Relationship Management (CRM) System: Analyzing clients' behavior, transactions or interactions so that the bank can better tailor services and target customers with appropriate offers.

Business Intelligence (BI) System: Nevertheless, this is one integrated system for distributing intelligence that encompasses gathering, analyzing, transmuting, and presenting banking intelligence from within the different departments in the bank for effective strategies like marketing, risk management, and portfolio optimization

(B) 1. **Operational/Transactional Systems**

* **Bank Clerks and Tellers:** They directly interact with the core banking system during daily transactions like deposits, withdrawals, and loan processing. They benefit from operational systems as they help in processing routine transactions in real-time.
* **ATM Operators:** ATM technicians benefit from the ATM management system, which helps them monitor and resolve operational issues related to ATM transactions.
* **Branch Managers:** They benefit from these systems as they provide real-time access to transaction records, account statuses, and allow for immediate resolution of customer issues or transaction discrepancies.

2. Analytical Systems

Marketing and Customer Relationship Managers: They derive the benefits of having a better and automated view of customer behavior thanks to the insights provided by the CRM system which can be useful while designing campaigns.

Senior Executives and Decision Makers: They also derive benefits from business intelligence systems which assist them in some of their decisions like loan portfolio analysis, profitability, risk management, and overall company strategy that require information from several sources.

Risk and Compliance Officers: These specialists also gain from the analytical systems which enable them to monitor key business risks and customer risk profiles in order to manage compliance and maximize the minimization of business risk.

(C) 1. **Loans**

* Loan ID (Primary Key)
* Loan Type (e. g., personal, mortgage, business)
* Loan Amount
* Interest Rate
* Loan Term (e. g., Status 12 (whether months, the 5 loan years) has been
* Client approved, ID is (Foreign being Key processed referencing or Clients) has been
* Approval rejected
* Disbursement Date
* Repayment Period

2**. Employees**

* Employee ID (Primary Key)
* First Name
* Last Name
* Date of Birth
* Position/Role
* Department
* Salary
* Hire Date
* Contact Information (Phone, Email)

3. **Clients**

* Client ID (Primary Key)
* First Name
* Last Name
* Date of Birth
* Address
* Phone Number
* Email Address
* Account Number (Foreign Key to Accounts table)
* National ID/Passport Number

4. **Accounts**

* Account Number (Primary Key)
* Account Type (savings, checking, loan etc. )
* Balance
* Date Opened
* Client ID (Foreign Key to Clients table)
* Account Status (active, inactive, closed)
* Branch ID (Foreign Key to Bank Branch)

5. **Bank Assets**

* Asset ID (Primary Key)
* Asset Type for example, (Asset property, Value vehicle
* Or Acquisition machinery. Date )
* Depreciation Rate
* Location for instance branch location or the head office.
* Asset Status (active, disposed, under maintenance).

**Section B.**

**Question Three**

**Case Study: Uganda Registration Services Bureau (URSB)**

The **Uganda Registration Services Bureau (URSB)** plays a critical role in providing registration services under various acts such as the **Business Name Registration Act**, the **Partnership Act**, and the **Trustees Act**. Its functions are essential for the legal formalization of businesses, partnerships, and other entities in Uganda. Below are detailed responses to the questions based on the business functions of URSB.

* 1. The **Business Information System (BIS)** at URSB is designed to streamline its operations and improve service delivery. Key functionalities include:

1. **Business Registration Management**:
   * The BIS supports the registration of businesses, partnerships, and trusts. It captures business names, ownership structures, and related legal documents.
   * **Example**: When a new business registers, the system stores essential data like business name, owner details, and the type of business.
2. **Document Management and Storage**:
   * The system stores all registration documents, certificates, and other essential legal paperwork digitally. This reduces manual filing and improves retrieval efficiency.
   * **Example**: A registered business can retrieve its registration certificate from the system as needed, and officials can verify documents quickly.
3. **Compliance Tracking**:
   * The BIS monitors the compliance of registered entities with local laws, ensuring that they renew licenses or update registration details as required.
   * **Example**: The system sends notifications to business owners when it’s time to renew their registration or submit annual returns.
4. **Reporting and Analytics**:
   * The system generates reports and analytics on the number of registrations, renewals, and other key metrics, helping URSB in decision-making and planning.
   * **Example**: URSB can generate monthly reports on the number of new businesses registered and analyze trends over time.

(3)(ii). **Business Name Registration**:

This is the process where businesses apply for their name along with the name of its owner for legal incorporation.

Example: A new company is set up by a local entrepreneur and such companies are required to file relevant documents including identification, business type, etc.

**Partnership Registration**:

This is a basic process when the registration of business partnerships is in order and there is a focused submission of a signed partnership agreement and respective identification documents for all the partners.

Example: Two people create a partnership to fill up a registration and make an application for one by presenting a partnership deed and personal ID.

**Trust Registration:**

This is a registration which aims to grant legal status to organizations that desire to be recognized as a Trust in particular when they apply and provide necessary documentation.

Example: A charity group aims to be a trust and registers as one and provides its trust deed with supporting documents of its cause.

**Business License Renewal:**

The process whereby a business that is registered files for a renewal of the license or registration at least once in every year or as stipulated in the law for every business entity.

Example: A business registration is also renewed every year for any new details or confirming no such changes are made to the status.

* 1. **Submission of Application**:

A petitioner seems to apply for registration of a business name. Such applicants give in documents which include identification, the intended business name and their contacts.

**Task description:**

The applicant uses the internet or a physical form to apply for a business name, undertakes the name registration, and pays for the application.

**Verification of Name Availability**:

The system determines the availability of the proposed business name so as to avoid cases of duplications within the database.

**Task description:**

The Business Information System (BIS) determines if the name is already registered and whether the registration composure is lawful by checking if the name uses swear words, does not confuse the users and such things.

**Data Entry and Processing:**

After the name verification, the URSB process the application, capturing the relevant business information in the databases of the office system.

**Task description**:

Manually or automatically, the registrar inserts the essential information bases on the business particulars such as business name, owner particulars or location of business into the Business Information System (BIS) for documentation purposes.

**Issuance of Registration Certificate:**

The the moment business registration and occupancy is done successfully, the computer system automatically generates a certificate to a registered business.

**Task description:**

The Registrar issues an official certificate either digitally or physically, confirming the business is legally recognized.

(Iv) The lexical item Business Name Registration has relations with other URSB processes which forms a value chain that guarantees effectiveness in the agency’s operations:

**Partnership Registration:**

Once a business name has been registered, there is an option of partnership formation by the business. This process depends on the Business Name Registration so as to make sure that the entity exists in law before the partnership is legally sealed.

Illustration:

For instance, an entity registered as "ABC Ltd." might later want to incorporate another entity as a partner. During establishing a partnership registration process, the business name registration of "ABC Ltd." will be referred to for endorsement.

**Business License Renewal:**

With the passing of time, whenever a business name is registered, the body must ensure that its license is updated frequently. The Business Name Registration also renews the operational character of the entity as it provides the legal status of the business and what it does.

Illustration:

Every year, business people who registered with URSB will be asked to renew their registrations based on a record of when they first registered their business.

**Trust Registration:**

Some firms may later on in their operations opt to operate as trusts. But also the Business Name Registration promotes this by establishing the entity so that it can later become a trust.

Illustration:

For example, an entity known as ABC Ltd may in future choose to be registered as a trust.

Question FOUR

( I ). Even though IS strategies can complement competitive strategies to provide firms with advantages over their competitors. This fit means that IS capabilities are aligned to the enterprise level business objectives. Here 's

* **Cost Leadership**:

IS can automate some processes and make them more effective to bring down cost of operations.

For example,

Banks introducing ATMs to decrease reliance on physical branches and help pay staff.

* **Differentiation:**

C-Information tech in business (IS) helps businesses develop product or service uniqueness.

Example: A bank that provides smart financial mobile applications with AI

* **Focus Strategy**:

IS is used for targeting specific market segments by customizing the services.

Illustration:

Using data analytics to create specialized financial products for high-net-worth clients by Banks.

* **Innovation:**

IS helps in developing new products or services and gives firms a first-mover advantage.

For example online-only banks (Chime or Monzo) using IS to have no need for a physical branch.

* **Operational Excellence**:

IS makes processes simpler, better service delivery and customer satisfaction.

Small example: With respect to banking, banks use core banking systems to lend people in 24/7.

(II) Porter’s Five Forces Framework identifies five key competitive forces that influence an industry. Here’s how these apply to the banking sector:

1. **Threat of New Entrants**:
   * New entrants like fintech startups pose a challenge to traditional banks.
   * **Example**: Mobile money services such as M-Pesa in Kenya lower barriers for entering financial services, disrupting traditional banks.
2. **Bargaining Power of Customers**:
   * Customers can switch banks easily, especially with the availability of online services.
   * **Example**: Customers comparing loan rates and opting for institutions with the lowest interest rates.
3. **Bargaining Power of Suppliers**:
   * In banking, suppliers include technology providers, data services, and skilled labor.
   * **Example**: Dependency on IT vendors for core banking solutions, such as Oracle or Finacle, gives these suppliers leverage.
4. **Threat of Substitute Products or Services**:
   * Alternatives like cryptocurrency or peer-to-peer lending platforms pose substitution threats.
   * **Example**: Platforms like LendingClub offering loans without involving traditional banks.
5. **Industry Rivalry**:
   * Intense competition among banks for market share is a significant force.
   * **Example**: Banks competing through aggressive marketing, lower fees, and enhanced digital experiences.

**(iii). Strategies to Address Competitive Forces (9 marks)**

To mitigate the impact of competitive forces, information system professionals can recommend the following strategies:

1. **Addressing Threat of New Entrants**:
   * Invest in innovation to stay ahead of new players.
   * **Strategy**: Develop digital-only banking services to appeal to tech-savvy customers.
   * **Example**: Offer seamless mobile banking experiences with biometric authentication.
2. **Dealing with Customer Bargaining Power**:
   * Enhance customer experience to build loyalty.
   * **Strategy**: Use customer relationship management (CRM) systems for personalized services.
   * **Example**: Send tailored offers and notifications based on spending patterns.
3. **Handling Supplier Bargaining Power**:
   * Reduce dependency on single suppliers by diversifying.
   * **Strategy**: Adopt open-source software solutions to reduce vendor lock-in.
   * **Example**: Use open banking platforms like API gateways.
4. **Mitigating Threat of Substitutes**:
   * Offer unique products or better customer experiences that substitutes cannot match.
   * **Strategy**: Introduce value-added services such as integrated investment platforms.
   * **Example**: A banking app that includes budgeting tools and financial health insights.
5. **Managing Industry Rivalry**:
   * Focus on cost efficiency and differentiation to outpace competitors.
   * **Strategy**: Use data analytics to identify and capture under-served market segments.
   * **Example**: Launch loyalty programs for long-term customers based on their transaction history.