School: ..... Campus: .....

Academic Year: ..... Subject Name: ..... Subject Code: .....

Semester: ..... Program: ..... Branch: ..... Specialization: .....

Date: .....

# Applied and Action Learning

(Learning by Doing and Discovery)

**Name of the Experiement : Blockchain in Supply Chains – Use Case Analysis**

## * Coding Phase: Pseudo Code / Flow Chart / Algorithm

- **Initialization of Participants:**

Identify all parties involved — Manufacturer, Supplier, Transporter, Distributor, Retailer, and Customer.

- **Product Registration:**

Each product is assigned a **unique digital ID** or token on the blockchain.
(e.g., Product ID #A123 is created by the manufacturer.)

- **Recording Transactions:**

Each stage of product movement (manufacturing, packaging, shipping, delivery, sale) is recorded as a new **block** on the blockchain.
Each block contains:

  - Product ID
  - Sender & Receiver information
  - Timestamp
  - Transaction details
  - Digital signature for authenticity

- **Verification and Validation:**

Every transaction is verified by participating nodes before being added to the chain — ensuring no false data is recorded.

- **Linking and Hashing:**

Each block is linked to the previous block using a **cryptographic hash**, maintaining a secure and tamper-proof record.

- **Consensus Mechanism:**

The network uses a **consensus protocol** (such as Proof of Stake or Proof of Authority) to validate entries, ensuring data consistency across all nodes.

- **Traceability and Tracking:**

All stakeholders can trace the **complete history of the product** — from raw material origin to the final sale.

- **Audit and Transparency:**

The immutable ledger serves as proof of authenticity for regulators, businesses, and customers.

## Software used:

1. VS Code.
2. MS Word.
3. Brave for researching.



*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.

## * Implementation Phase: Final Output (no error)

- The supply chain network is created, connecting all stakeholders such as the manufacturer, supplier, transporter, distributor, retailer, and customer.
- The manufacturer registers a new product on the blockchain by creating its **unique digital record** with all essential details (product ID, date, batch number, and origin).
- As the product moves through the supply chain, each stage (manufacturing, packaging, shipment, delivery, and sale) is recorded as a **new block** on the blockchain.
- Every transaction is **validated by the network participants**, ensuring data accuracy and preventing unauthorized changes.
- Each verified transaction is **linked to the previous block** using a **cryptographic hash**, maintaining data integrity and forming an unbreakable chain.
- The blockchain ledger is **automatically updated across all nodes**, ensuring that every participant has access to the latest and most accurate data.
- The system provides **real-time tracking** of the product's status and location throughout the supply chain.
- The final blockchain ledger displays a **complete and transparent history** of the product from its origin to its final delivery to the customer.
- The output demonstrates **secure, tamper-proof, and trust-based record-keeping**, eliminating fraud, improving accountability, and enhancing supply chain visibility.

## * Observations:

- Each transaction is recorded permanently — ensuring data integrity.
- Blockchain creates transparency among all parties, reducing disputes.
- Counterfeit detection becomes easier since each product has a unique digital record.
- Smart contracts automate payment and delivery confirmations.
- Real-time tracking helps identify bottlenecks and delays.
- Improves trust between suppliers and customers by providing verifiable proof of product origin.

## ASSESSMENT

| Rubrics | Full Mark | Marks Obtained | Remarks |
|---|---|---|---|
| Concept | 10 | | |
| Planning and Execution/ Practical Simulation/ Programming | 10 | | |
| Result and Interpretation | 10 | | |
| Record of Applied and Action Learning | 10 | | |
| Viva | 10 | | |
| **Total** | **50** | | |

***Signature of the Student:***

*Name :*

*Regn. No. :*

***Signature of the Faculty:***



**As applicable according to the experiment.*
*Two sheets per experiment (10-20) to be used.*