**Lab Outline**

**1. History of Flow-Charts**

* **Overview:**Flow charts were first introduced by Frank Gilbreth in 1921. They gained popularity for process improvement in industrial engineering and later in software development.
* **Lab Task:**
  1. Research and write a short paragraph about the evolution of flow charts.
  2. Compare historical and modern uses of flow charts.

**2. Why We Use Flow Charts**

* **Purpose:**
  1. Visual representation of processes or algorithms.
  2. Simplifies problem understanding and debugging.
  3. Enhances communication among team members.

**3. Symbols of Flow Charts**

* 1. Oval: Start/End
  2. Rectangle: Process
  3. Diamond: Decision
  4. Arrow: Flowline
  5. Parallelogram: Input/Output
* **Lab Task:**Create a simple flow chart using these symbols for:
  1. Finding whether a number is even or odd.
  2. Summing two numbers.

**4. Tools for Flow Charts**

* 1. Pen and Paper
  2. Online Tools: Lucid chart, Draw.io, Microsoft Visio, etc.
* **Lab Task:**
  1. Install and explore an online tool like Draw.io.
  2. Create a flow chart for a small algorithm (e.g., calculating the factorial of a number).

**5. Examples of Flow Charts**

* **Examples to Practice:**
  1. ATM Withdrawal Process.
  2. Decision Tree for Choosing a Meal.
  3. Printing "Hello World" in a loop 5 times.
* **Lab Task:  
  Select one example and design its flow chart using the tool of your choice.**

**6. Control Structure of Algorithm and Flow Charts**

* **Control Structures:**
  1. Execute steps one after another.
  2. Conditional branching (if-else).
  3. Looping (Iteration): Repeated execution of steps (for, while).
* **Lab Task:  
  Design flow charts for:**
  1. **Sequential: Adding two numbers.**
  2. **Decision: Checking if a number is positive or negative.**
  3. **Looping: Printing numbers from 1 to 10.**

**Expected Outcomes**

* Students can describe the history and purpose of flow charts.
* Students can identify and use standard flow chart symbols.
* Students can create flow charts using tools and apply control structures.