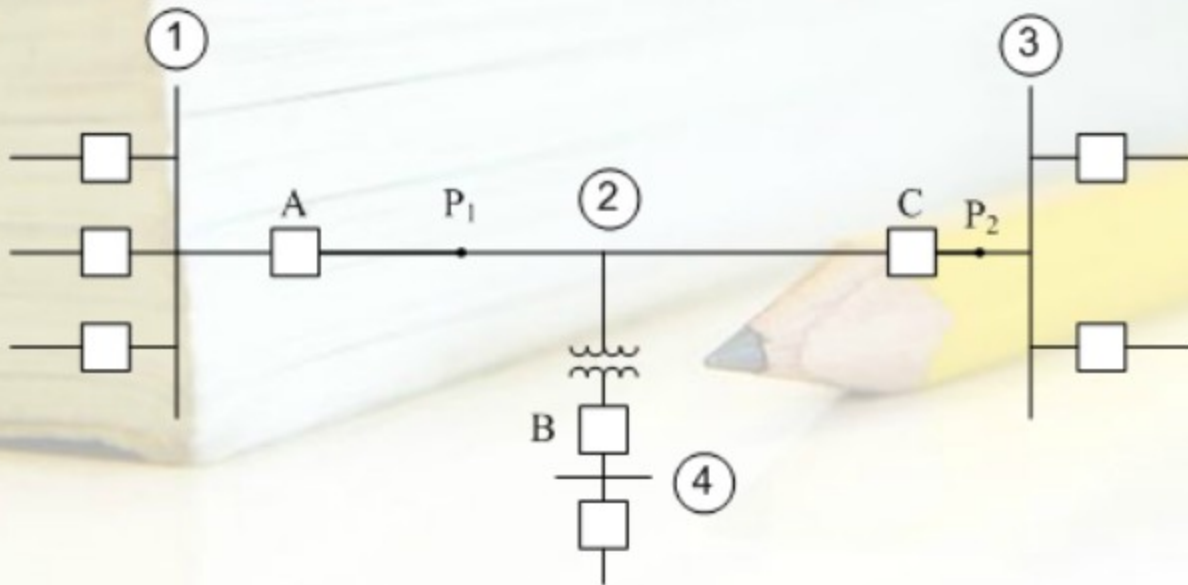


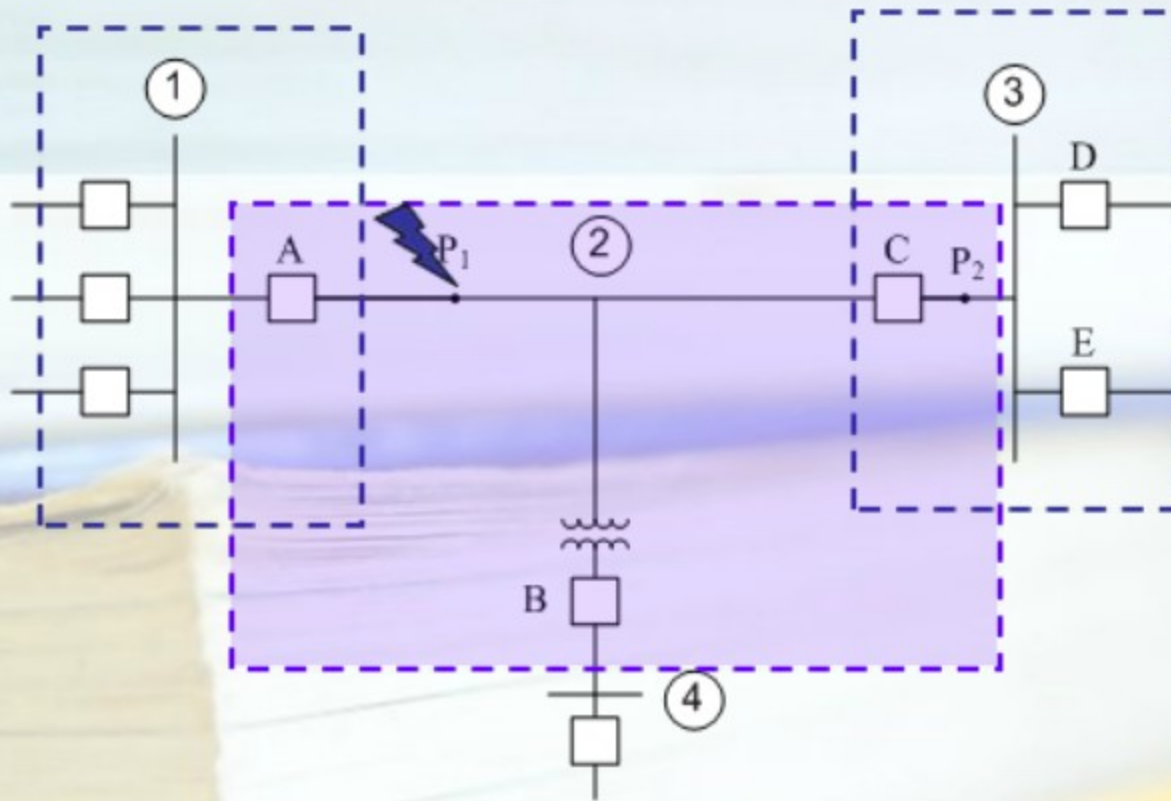
# Lecture-17

Examples on relay

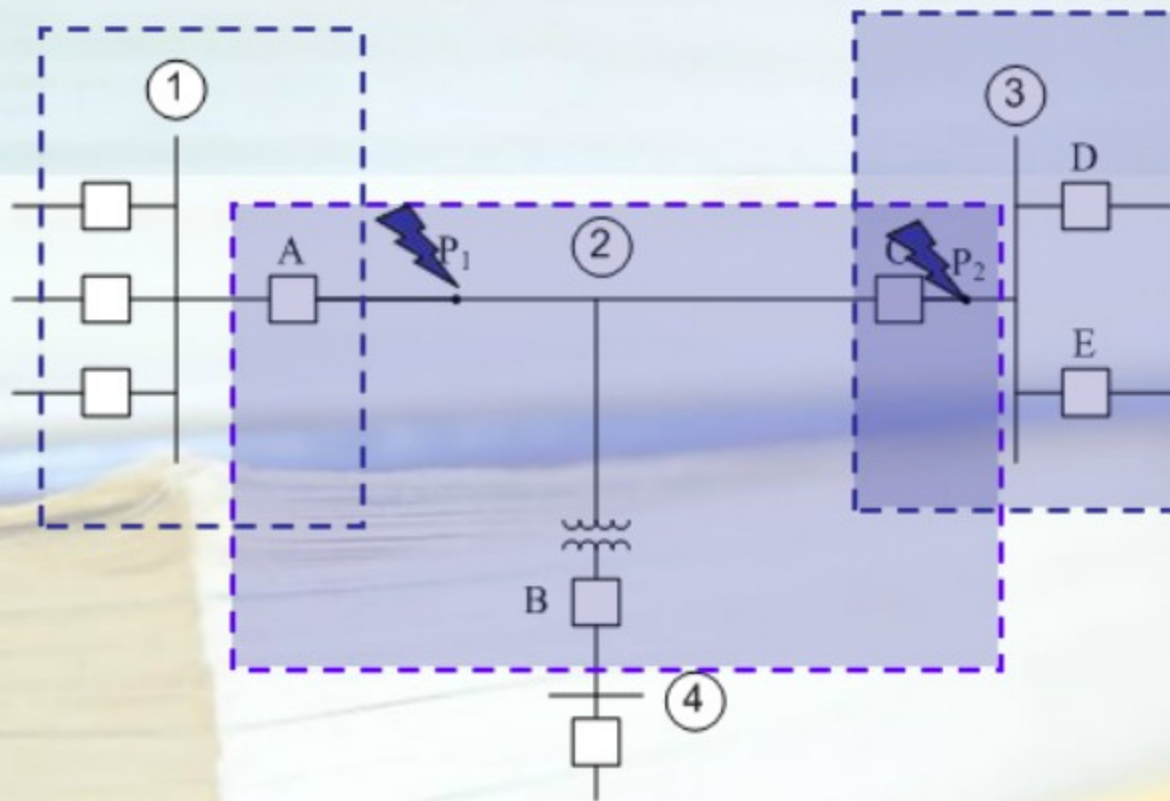
# Example

- a) Consider the power system shown below, with the generating source beyond buses 1, 3 and 4. What are the zones of protection in which the system should be divided? Which circuit breakers will open for faults at P1 and P2?





Fault at  $P_1 = A, B, C$



Fault at  $P_1 = A, B, C$

Fault at  $P_2 = A, B, C, D, E$

# Back-up Protection

## 1. Duplicate Primary

- Provide primary protection when the primary-relaying equipment is out of service for maintenance or repair
- Disconnect when primary relaying operates correctly
- Operate with sufficient time delay (coordination time delay) if primary not operate
- When short circuit occur, both primary and back-up start to operate, but if primary is operate, then the back-up will reset.

# Back-up Protection

## 2. Remote Back-up

- located outside boundary of Zone of Protection

