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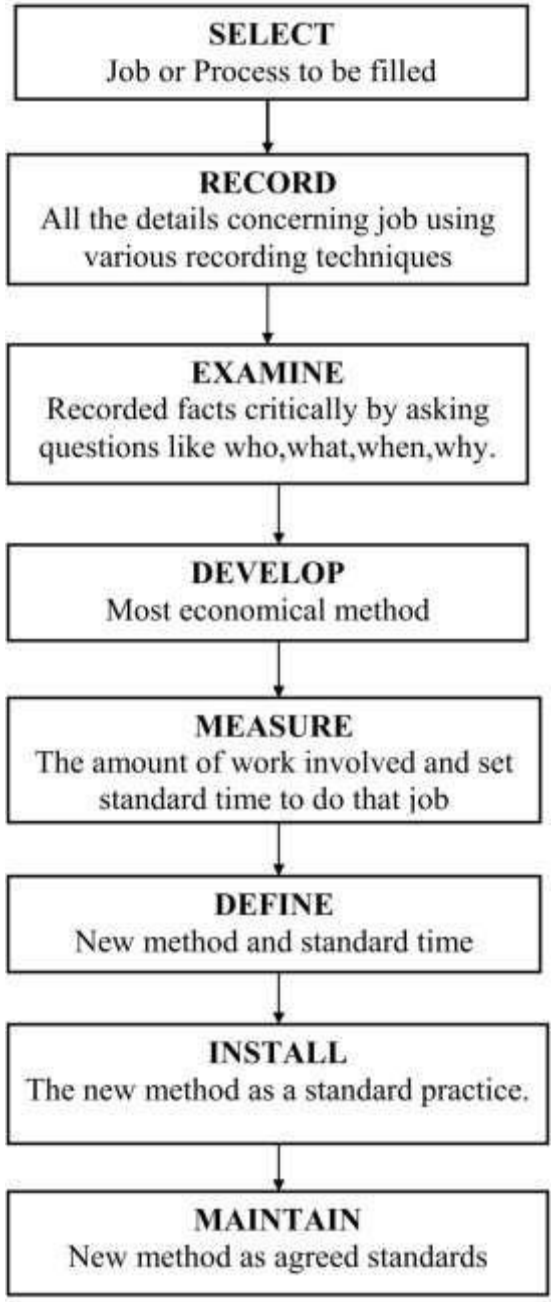
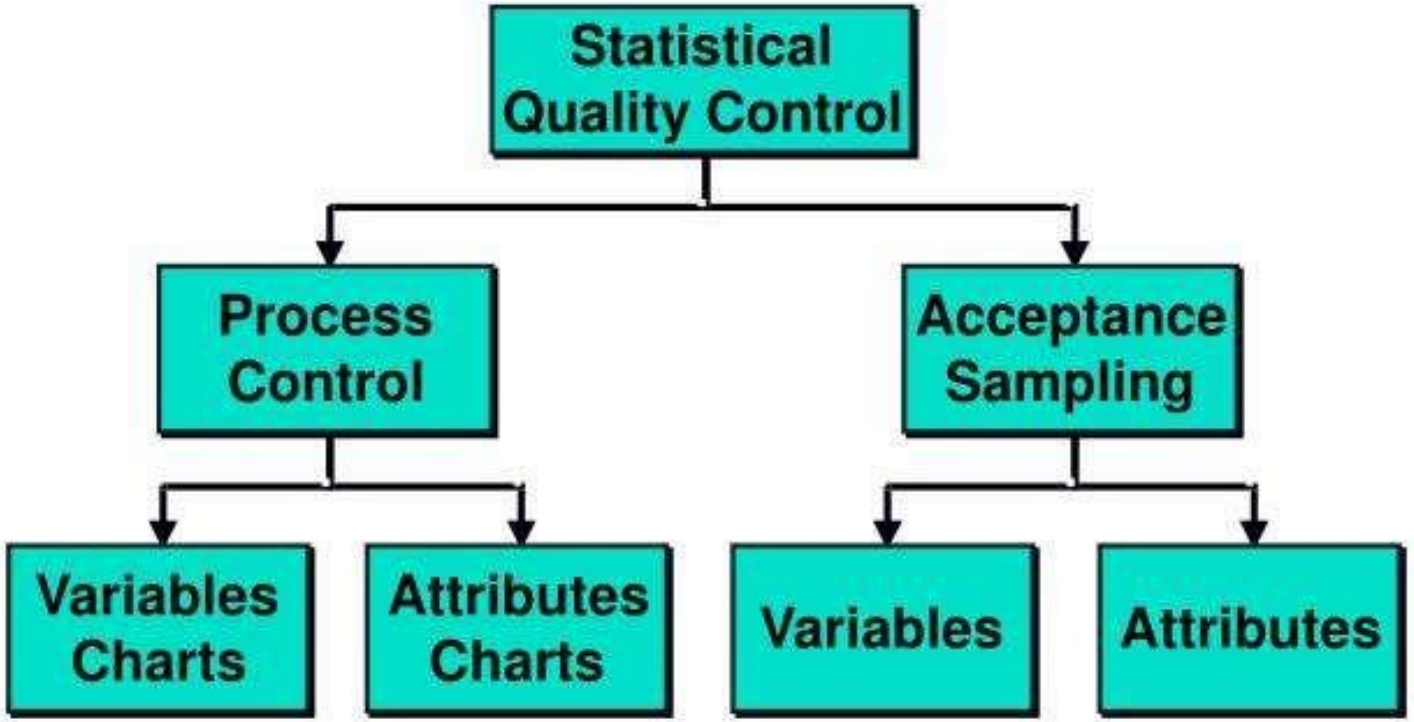
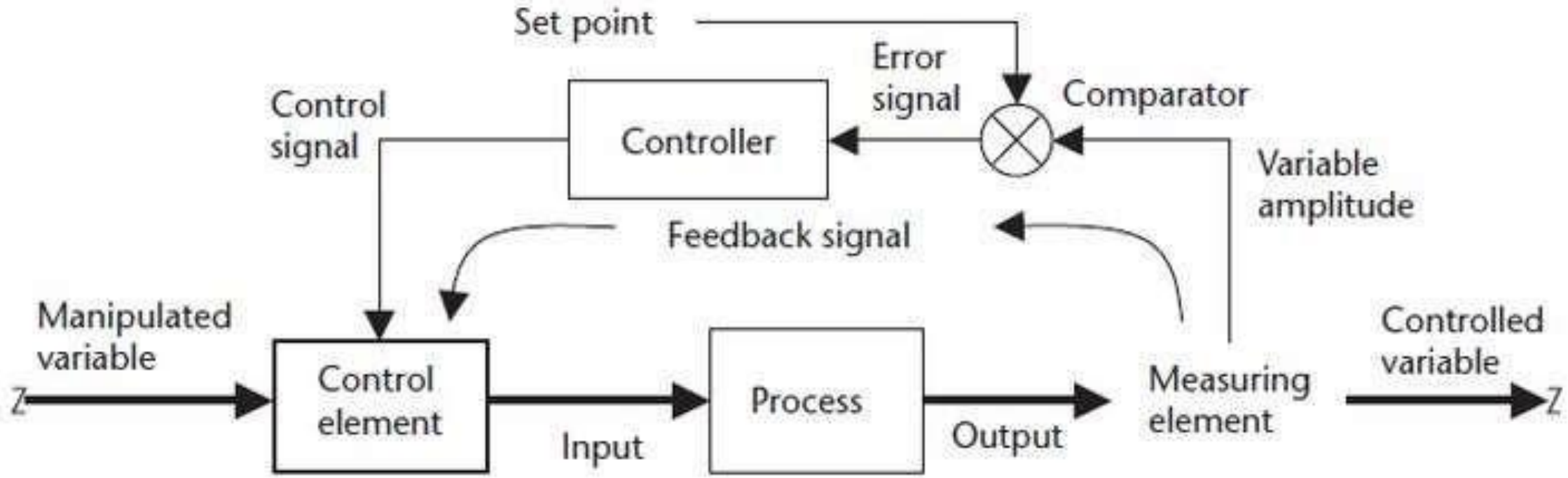

SELECT
Job or Process to be filled
RECORD
All the details concerning job using various recording techniques
EXAMINE
Recorded facts critically by asking questions like who,what,when,why.
DEVELOP
Most economical method
MEASURE
The amount of work involved and set standard time to do that job
DEFINE
New method and standard time
INSTALL
The new method as a standard practice.
MAINTAIN
New method as agreed standards

Types of Statistical Quality Control




Quality Control
Internal QC
External QC

PROCESS CONTROL



Statistical Quality Control (SPC)

- Measures performance of a process
- Uses mathematics (i.e., statistics)
- Involves collecting, organizing, & interpreting data
- Objective: provide statistical signal when assignable causes of variation are present
- Used to
  - Control the process as products are produced
  - Inspect samples of finished products

Statistical Process Control (SPC)

- Measures performance of a process
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- Involves collecting, organizing, & interpreting data
- Objective: Regulate product quality
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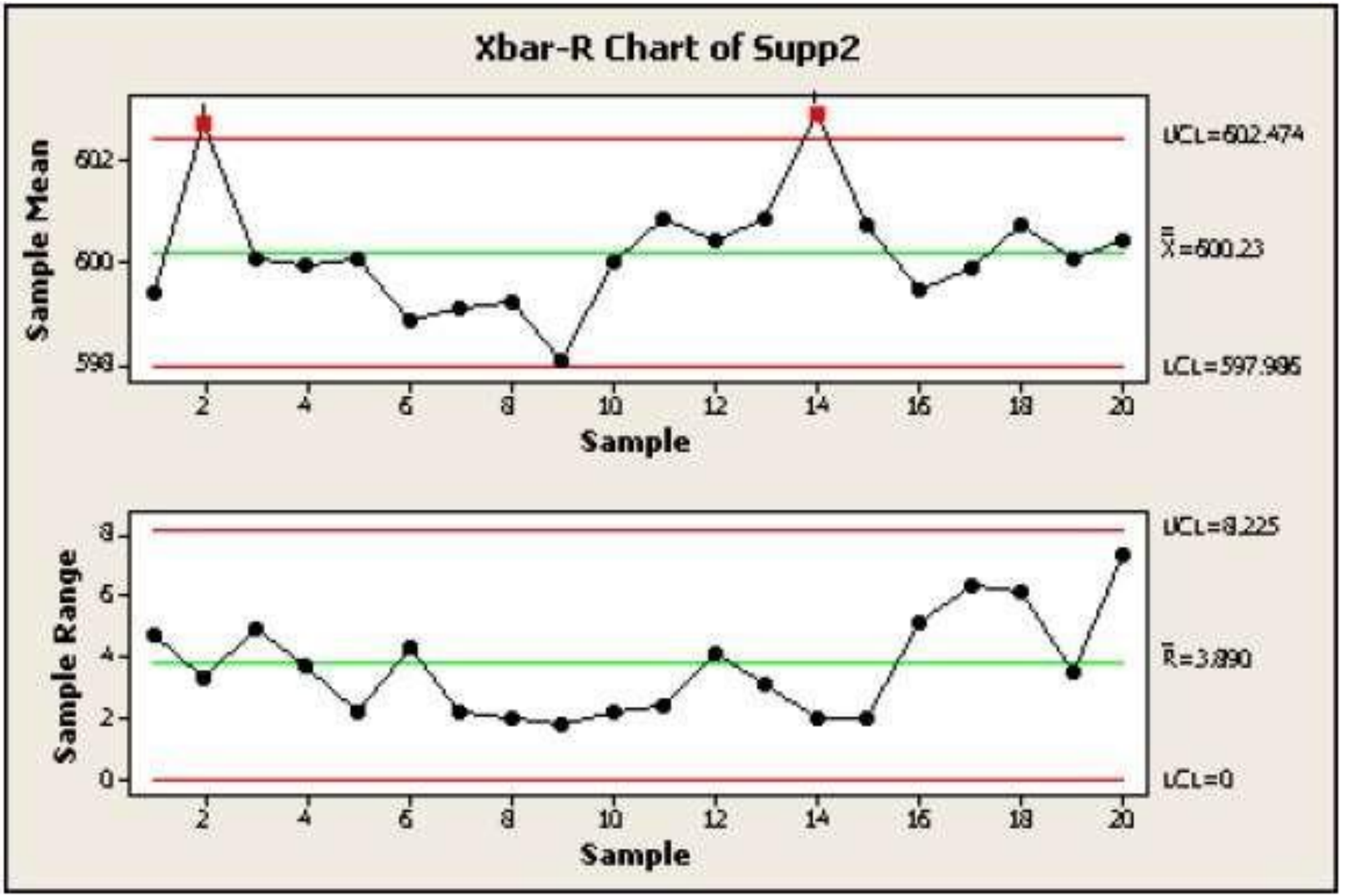
Statistical Process Control

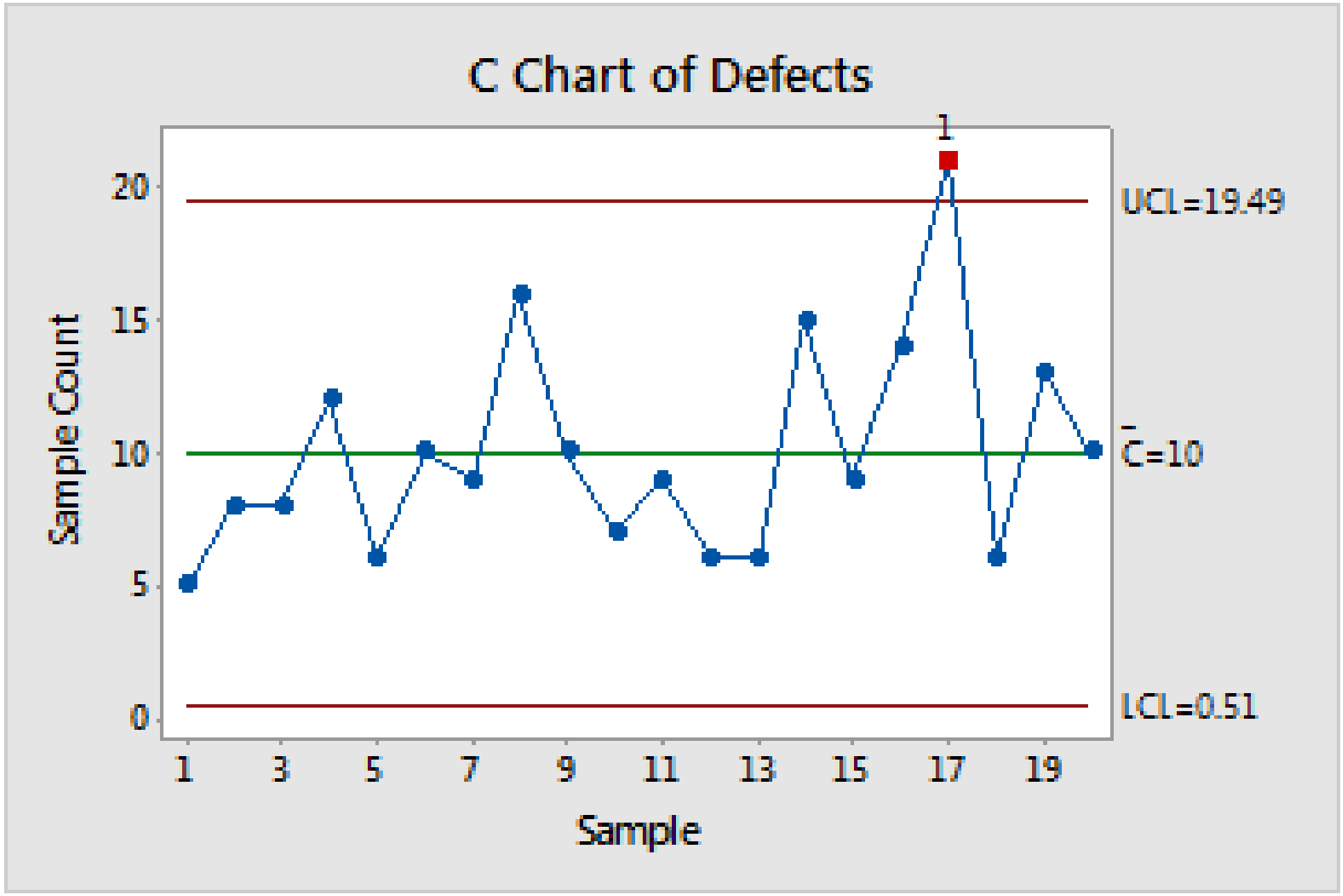
- The name **statistical process control** implies that statistical analysis of manufactured parts will be used to control and improve the manufacturing process.
- SPC is a group of statistical methods used to
  - Measure
  - Analyze
  - regulate
  - a production process to reduce defects.
- Defect is defined as any variation of a required characteristic of the product or part that deviates sufficiently from the nominal value to prevent the product or part from fulfilling the physical and functional requirements of the customer.


Xbar-R Chart of Supp2
Sample Mean
602
600
598
UCL=602.474
X=600.23
LCL=597.986
2
4
6
8
10
12
14
16
18
20
Sample
Sample Range
8
6
4
2
0
UCL=8.225
R=3.890
LCL=0
Sample

$$UCL = \bar{c} + 3\sqrt{\bar{c}}$$

$$CL = \bar{c} = \sum c_i / n$$

$$LCL = \bar{c} - 3\sqrt{\bar{c}}$$


C Chart of Defects
Sample Count
Sample
1
20
15
10
5
0
1
3
5
7
9
11
13
15
17
19
UCL=19.49
C̄=10
LCL=0.51

$$UCL = \bar{p} + 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

$$LCL = \bar{p} - 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}}$$

Acceptance Sampling

- Acceptance sampling is a statistical process for determining whether to accept or reject a lot of products by testing a random sample of parts taken from the lot.
- *An acceptance sampling plan is specified by n and c, where,*
  - n = the sample size, and
  - c = the critical number of defectives in the sample up to which the lot will be accepted.

Deming's Fourteen Points (2)

1. Create constancy of purpose toward the improvement of products and services in order to become competitive, stay in business, and provide jobs.
2. Adopt the new philosophy. Management must learn that it is a new economic age and awaken to the challenge, learn their responsibilities, and take on leadership for change.
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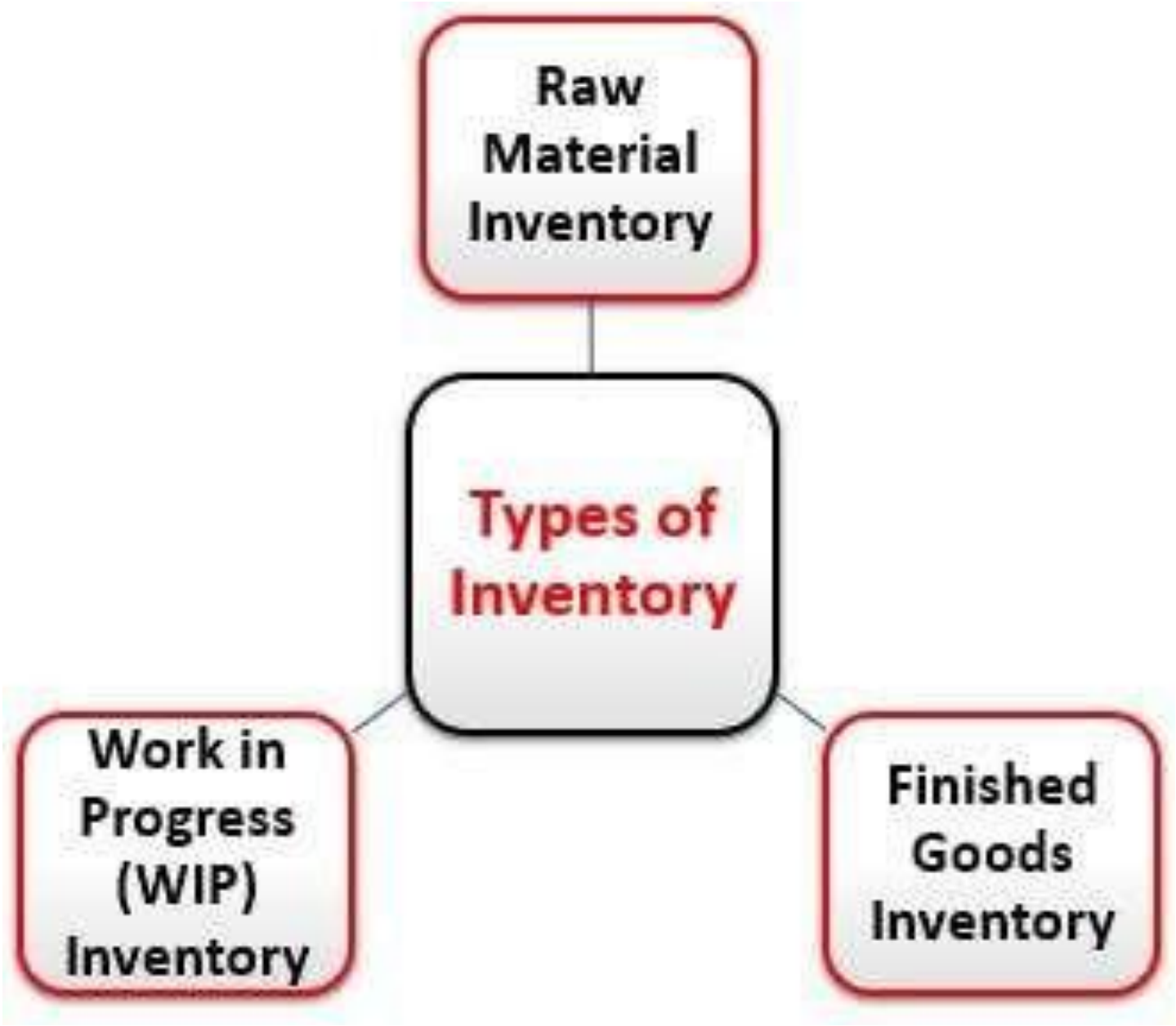
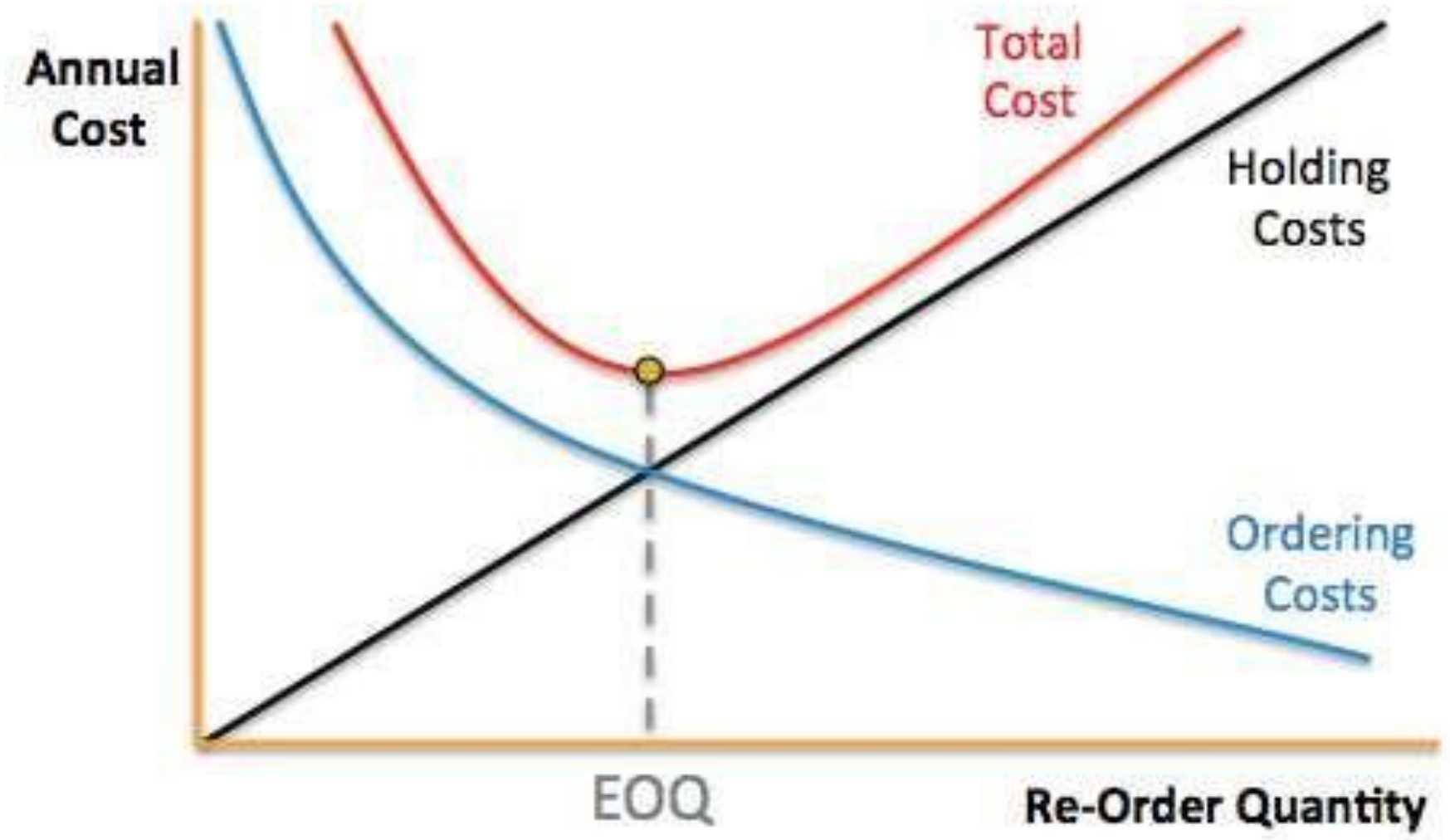
Functions of Material Management.

1. Planning and programming for materials purchased.
2. Stores and stock control
3. Receiving and issue of material.
4. Transportation and material handling.
5. Disposal of Scrap and surplus material.
6. Value engineering and value analysis.


Raw Material Inventory
Types of Inventory
Work in Progress (WIP) Inventory
Finished Goods Inventory


STEPS IN PROCUREMENT PROCESS
Need recognition
Vendor selection
Internal approval
Purchase order
Order details and invoice
Payment
Maintain a record
SpendEdge

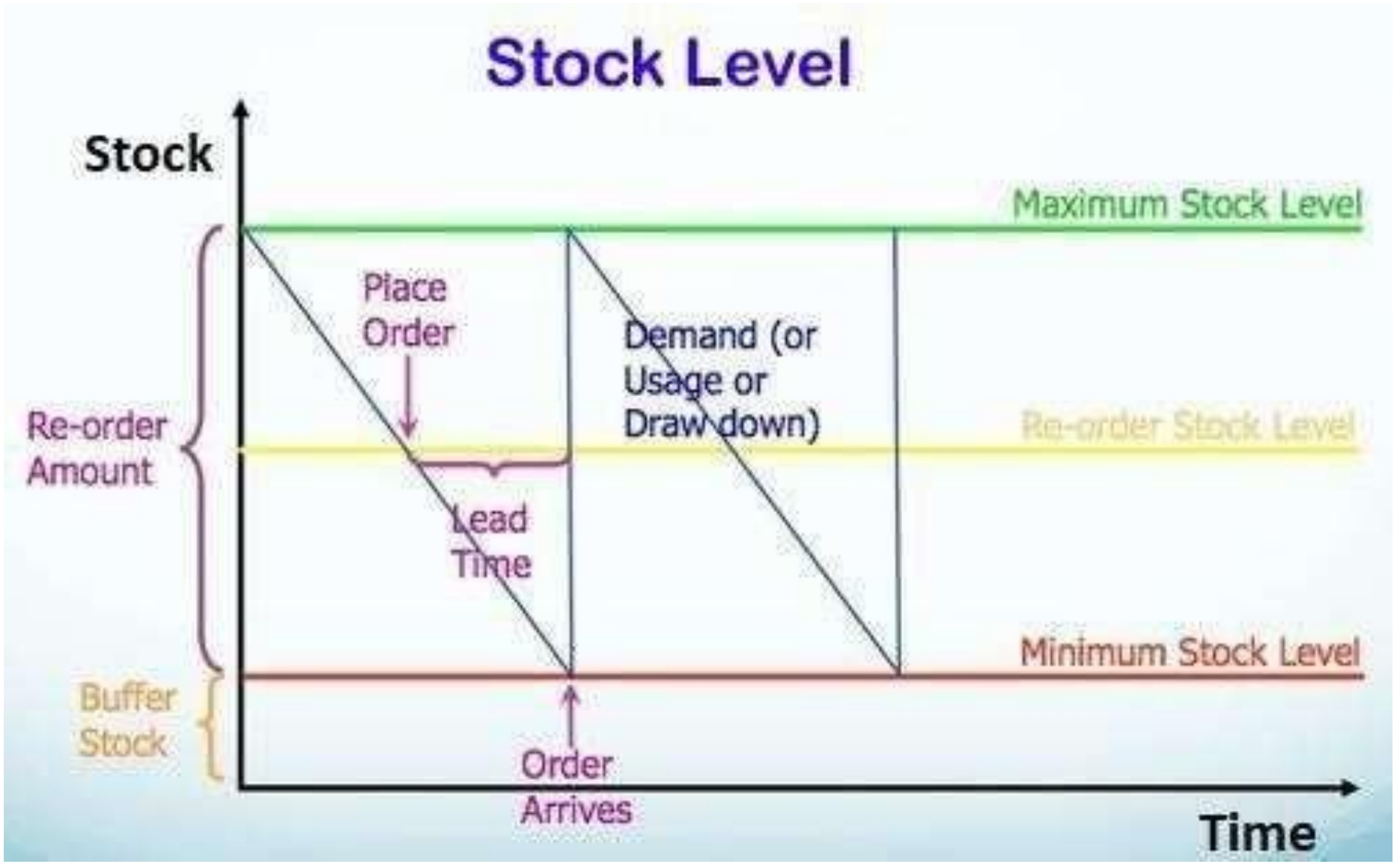

Annual Cost
Total Cost
Holding Costs
Ordering Costs
EOQ
Re-Order Quantity

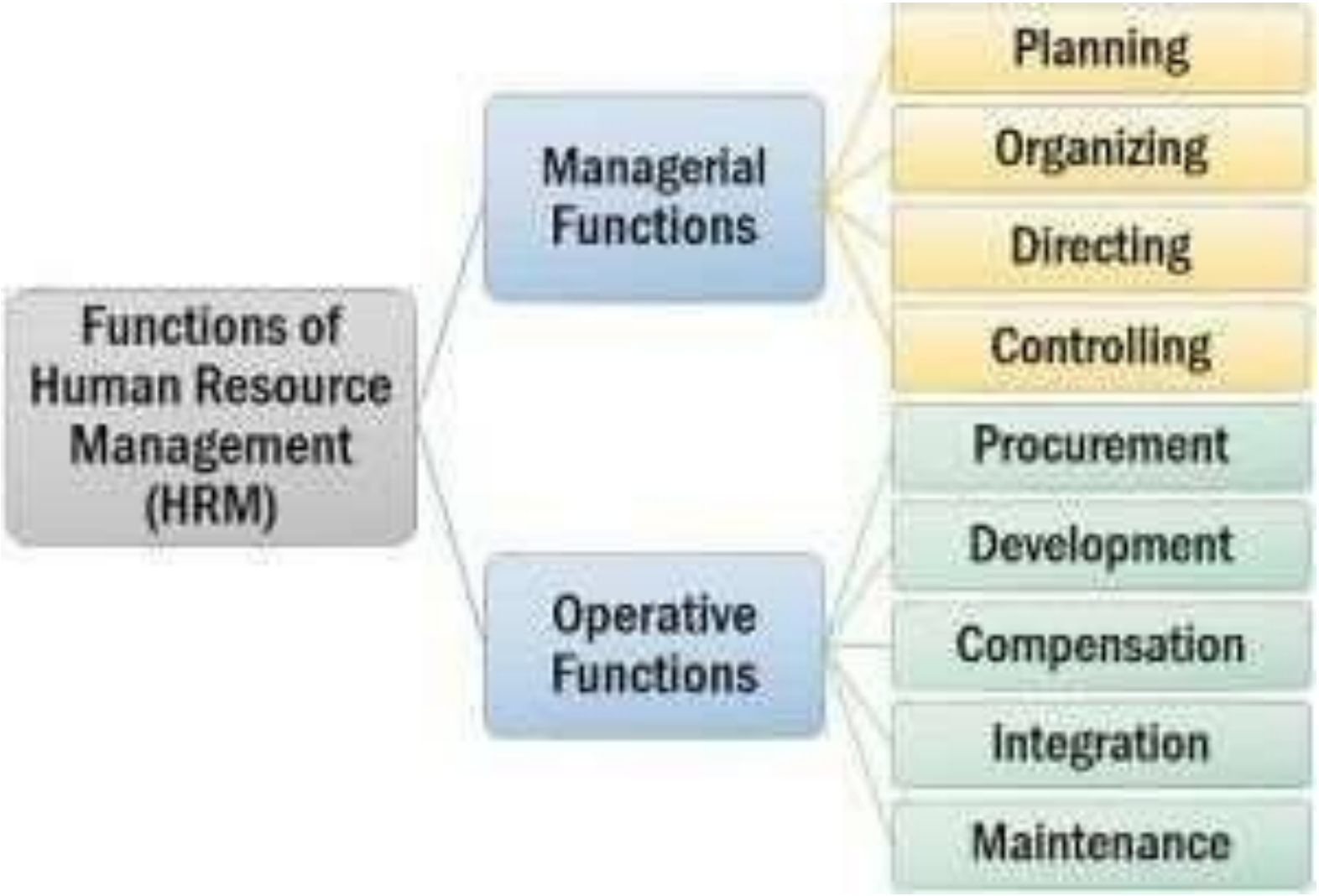
Economic Order Quantity

$$EOQ = \sqrt{\frac{2 \times D \times S}{H}}$$

D = Annual demand (units)
S = Cost per order ($)
C = Cost per unit ($)
I = Holding cost (%)
H = Holding cost ($) = I x C

Category	Percentage of Inventory Items	Percentage Value of Items
A	5-25%	40-80%
B	20-40%	15-40%
C	40-75%	5-20%


Stock Level
Stock
Maximum Stock Level
Place Order
Demand (or Usage or Draw down)
Re-order Amount
Re-order Stock Level
Lead Time
Minimum Stock Level
Buffer Stock
Order Arrives
Time


Functions of Human Resource Management (HRM)
Managerial Functions
Operative Functions
Planning
Organizing
Directing
Controlling
Procurement
Development
Compensation
Integration
Maintenance

The 4 Steps in Manpower Planning

1. Demand forecasting
2. Supply analysis
3. Gap analysis
4. Action planning

Recruitment Process

Steps in Selection Process

1. Preliminary Interview
2. Receiving Applications
3. Selection Test
4. Employment Interview
5. Medical Examination
6. Reference Check
7. Final Selection


Workshop
Development
Skills
Learn
TRAINING
Coaching
Teaching
Knowledge

- **Placement** is the process of strategically assigning a job to a candidate based on their competencies and job specifications. It ensures their individual development while meeting the organization’s workforce requirements
- **Wages** are hourly or daily-based payments given to labor for the amount of work finished in a day.

- **Salaries** are fixed annual amounts paid to employees for their work, usually at regular intervals (weekly, biweekly, or monthly).

- Employee **promotion** refers to the advancement of an employee to a higher position within an organisation. It is a process by which an individual is given increased responsibilities, authority, and possibly a higher salary or benefits package. Employee promotions are typically based on merit, performance, skills, experience, and potential.

- **Transfer is a change in job assignment. It is the internal or external movement of an employee from one section to another without involving any substantial change in his duties, responsibilities, required skill, status, and compensation.**

PLANT LOCATION AND LAYOUT

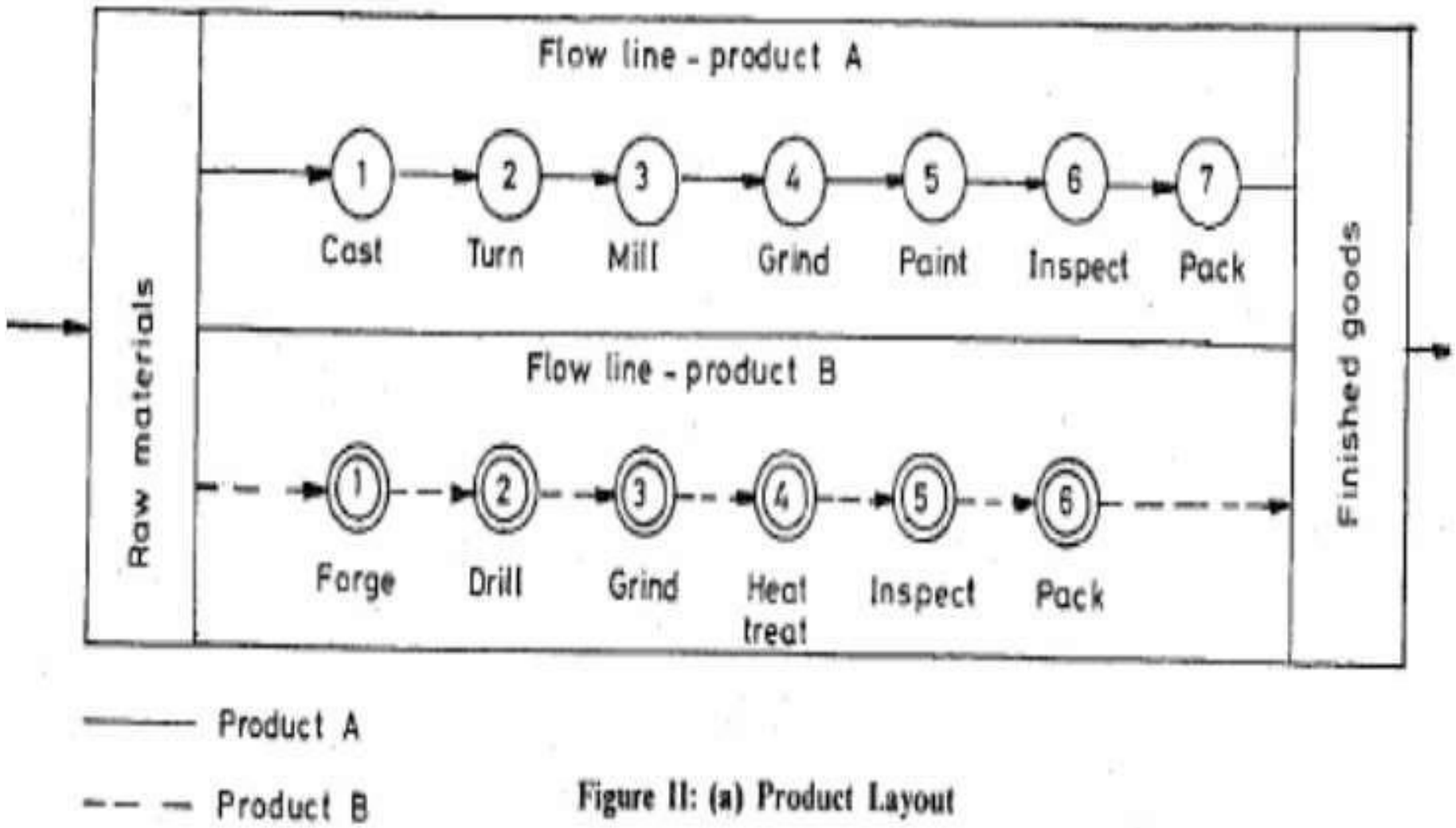


Figure II: (a) Product Layout

Job Production (characteristics)

When JOB PRODUCTION carried out according to the specifications of the customers order, it is known as "JOB LOT"

- Small Production.
- Production Cycle Time.
- Discontinuous Flow of Materials and Components.
- Nature of Supervisions.
- In Process work Inventory.

BATCH PRODUCTION

ADVANTAGES	DISADVANTAGES
Allows flexible production	Production runs of small batches are expensive to produce
Stocks of partly finished goods can be stock piled and completed later, allowing a quick response to new orders	If production runs are different from each other there may be extra costs and time delays in setting up different equipment


MASS PRODUCTION ADVANTAGES
Increased productivity
Uniformity
Lower cost
Higher quality of life
Faster production
Safer medicine
Less error
Job specialties
Increased worker safety
Rapid evolution

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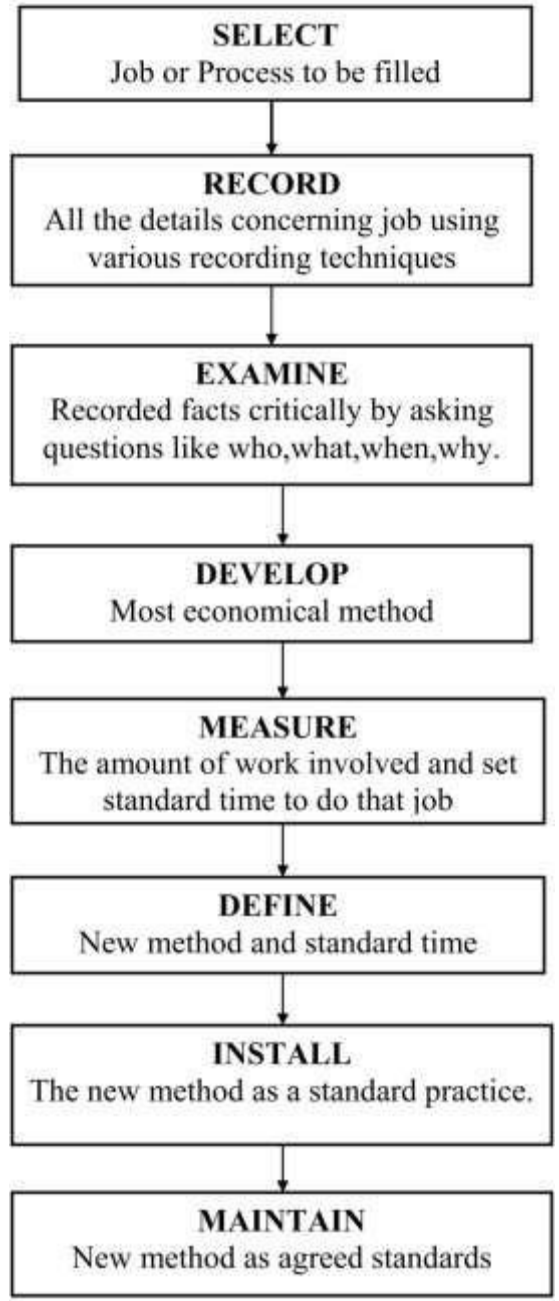
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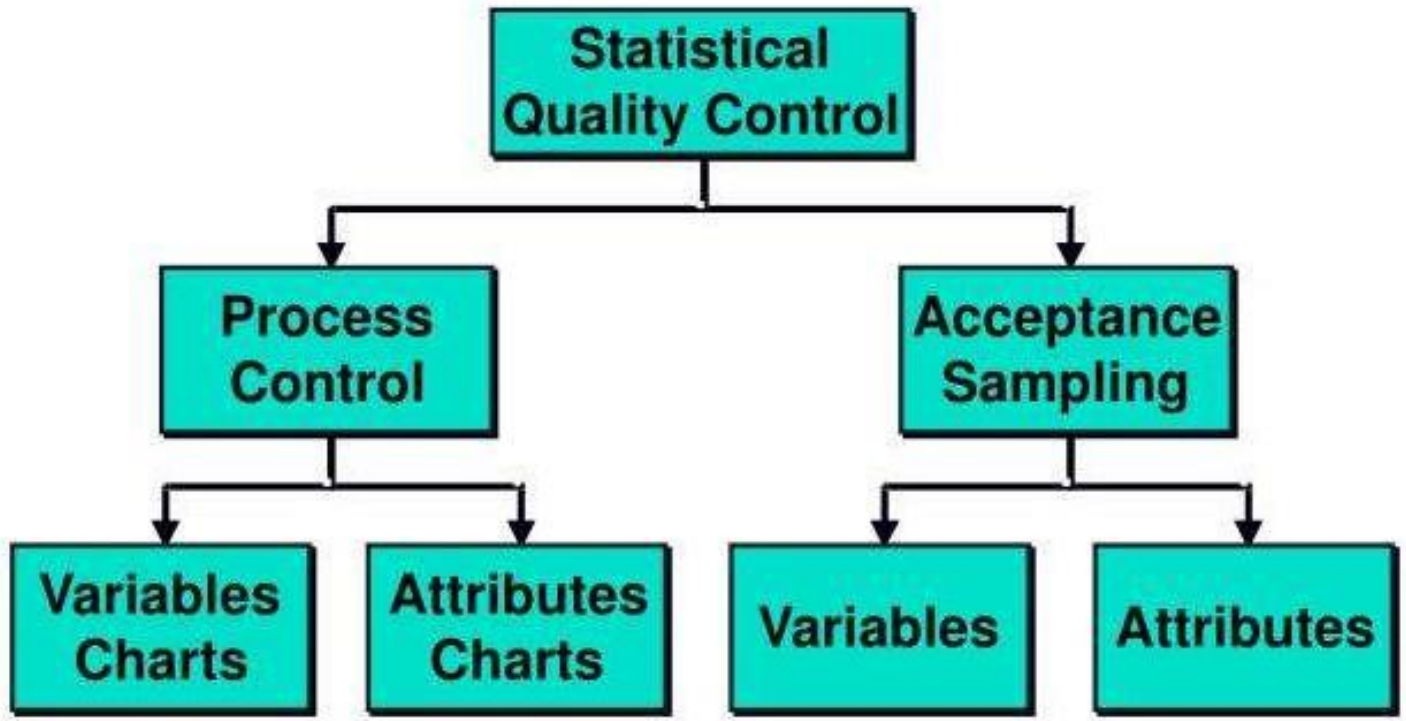


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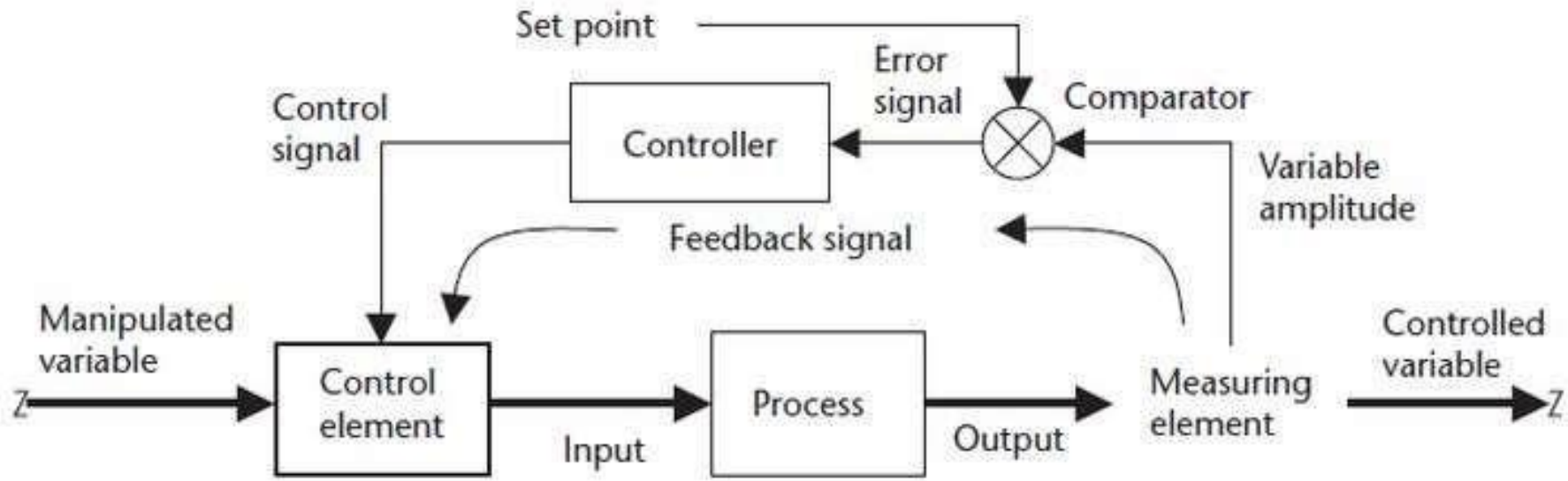

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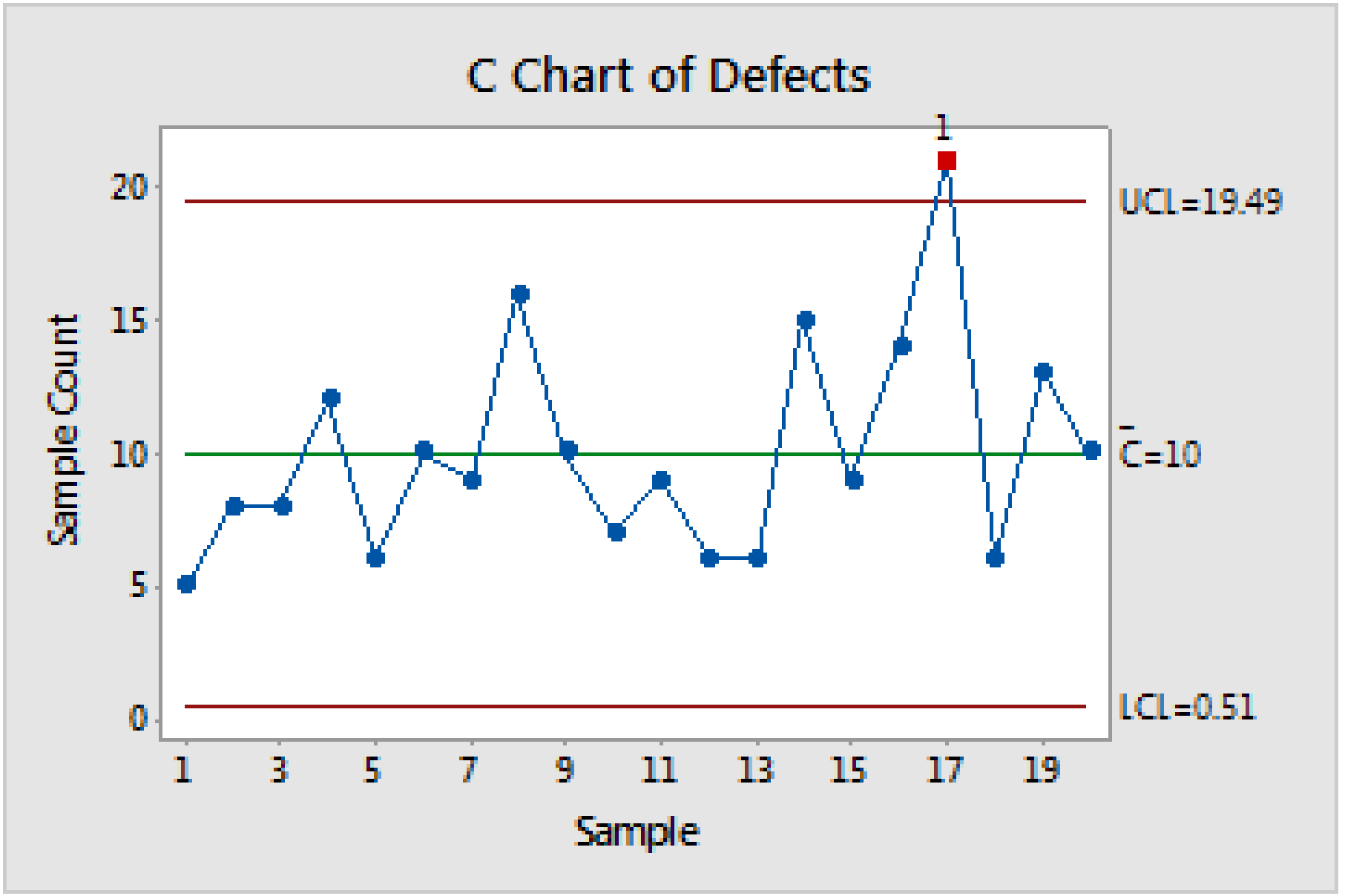
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p-Chart Control Limits

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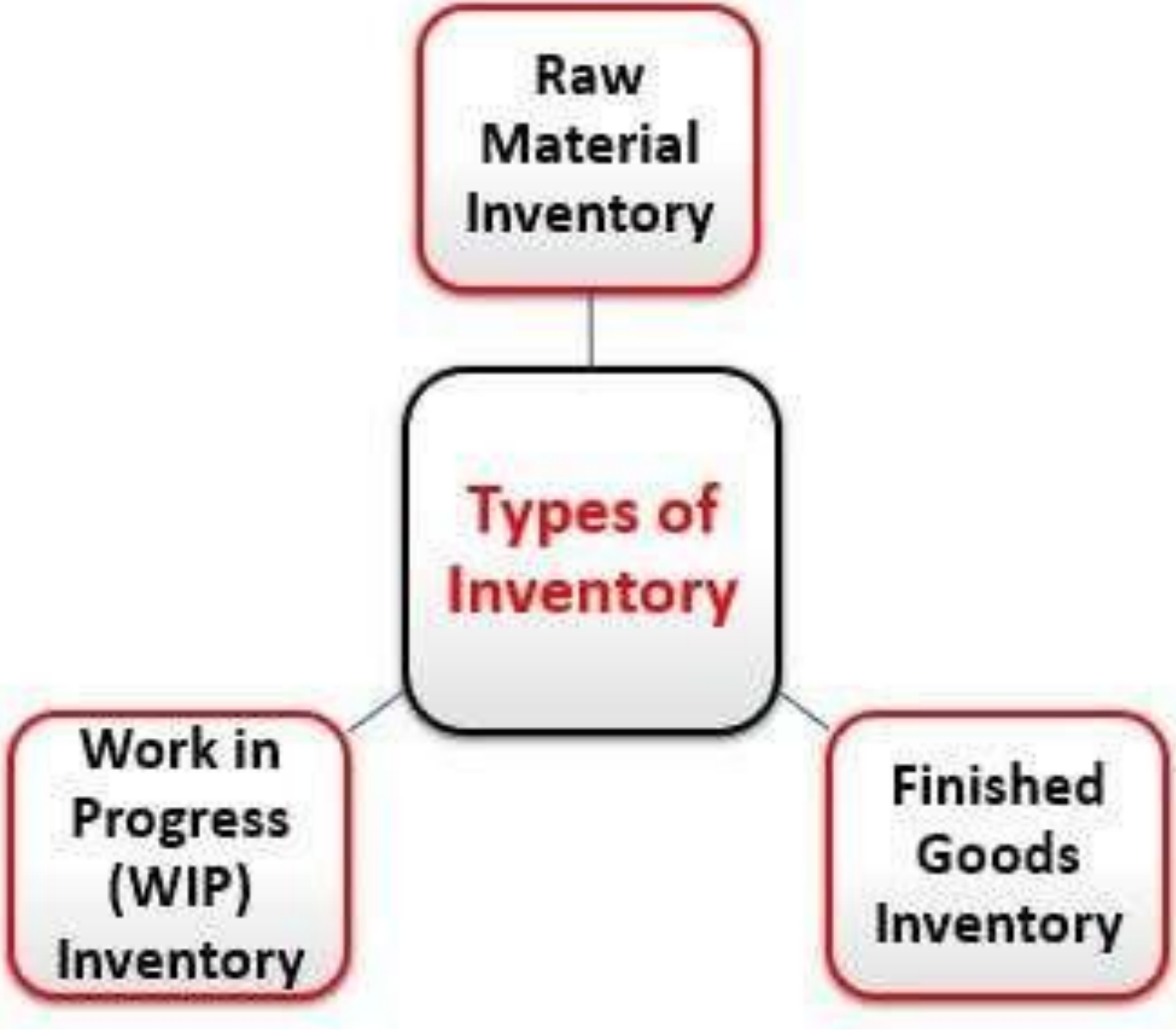
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