

Industrial engineering and quality control:-

Plant location and layout:-

- Describe the features governing plant location.
- Define plant layout.
- Describe the objective and principles of plant layout.
- Explain process layout, product layout and combination layout.

Defⁿ of industrial engineering:-

Industrial engineering is concerned improvement, and installation of integrated materials, and equipment

→ plant layout - A method of organizing the elements of a production process, in which similar processes and functions are grouped together.

(or) is the physical arrangement of equipment and facilities within a plant.

(or) is the organization of physical facilities like machinery, equipment & the allocation of space for the various activities of the plant & personnel.

principles of plant layout:-

1. principle of integration (of S.M.I.S)
2. principle of minimum distance
3. principle of cubic space utilization (both horizontal & vertical space).
4. principle of flow (must be forward no back-tracking).

- principle of maximum flexibility.
- principle of safety, security & satisfaction.
- principle of minimum handling.

objectives of plant layout:-

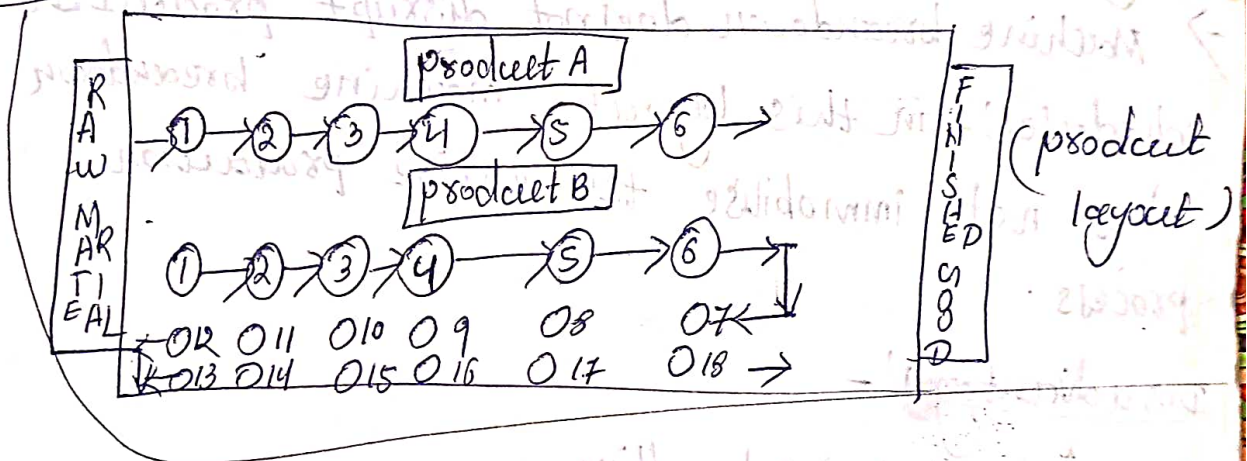
- proper and efficient utilization of available floor space.
- to ensure that work proceeds from one point to another point without any delay.
- provide enough production capacity.
- Reduce material handling costs.
- Reduce hazards to personnel.
- utilize labour efficiently.
- increase employee morale.
- Reduce accidents.
- provide ease of supervision and control.
- provide employee safety and health.
- Allow ease of maintenance.
- Allow high machine or equipment utilization.
- improve productivity.
- to minimize cost of production.
- Better inter department relationship.

process layout:- in manufacturing process layout is a design for the floor plan of a plant which aims to improve efficiency by arranging equipment

according to its function.

→ The production line should ideally be designed to eliminate waste in material flows, inventory handling and management. (✓)
en-machine shop.

(os) This type of layout is generally used in systems where a product has to be manufactured or assembled in large quantities.



(os) in a

process layout:- it is also called functional layout

→ In this layout more emphasis is given to specialisation or functional homogeneity on various components of the system.

→ All machines performing similar type of operations are grouped at one location in the process layout.

Advantages:-
→ optimum use of capacity:- it eliminates the duplication of machines and enables the optimum of installed capacity.

→ Inside flexibility in production facilities: - The system is more flexible to adjust modifications and changes in production strategies. Each machine/equipment can perform a wide range of similar operations.

→ effective supervision: - supervision and inspection work can be independently and efficiently carried out by each department.

→ Machine breakdown does not disrupt production schedules: - in this layout, machine breakdown does not immobilise the entire production process.

Disadvantages: -

→ More material handling

→ longer processing time

→ Requires substantial production planning and control.

→ Requires more floor space.

→ Higher flow times of products.

→ Machine loading is high.

→ Buffer stock is essential.