LOCATION OF FACILITIES

- Location of facilities for operations is **a long-term capacity decision** which involves **a long term commitment** about the geographically static factors that affect a business organization. It is an important strategic level decision-making for an organization.

- **The selection of location is a key-decision** as large investment is made in building plant and machinery.

- An improper location of plant may lead to waste of all the investments made in plant and machinery equipments.
- Hence, location of plant should be based on the company's expansion plan and policy, diversification plan for the products, changing sources of raw materials and many other factors.
- The purpose of the location study is to find the optimal location that will results in the greatest advantage to the organization.

PLANT LAYOUT

- Plant layout refers to the physical arrangement of facilities. It is the configuration of departments,work centres and equipment in the conversion process.
- The overall objective of the plant layout is to design a physical arrangement that meets the required output quality and quantity most economically.

OBJECTIVES OF PLANT LAYOUT

1. Integrate the production centres
2. Reduce material handling
3. Effective utilization of available space
4. Worker convenience and job satisfaction
5. Flexibility
6. Quick disposal of work
7. Smooth flow of operation
8. Avoids industrial accidents

TYPES OF PLANT LAYOUT

1. Process layout or functional layout:

- Similar machine grouped together
- Used in job and batch production and non-repetitive type of work.
- This type of layout makes production planning and control more difficult.
- For example,all lathes grouped together in turning section.

2. Product layout or line layout:

- Machines and auxiliary services arranged in line according to sequence of operation to be performed on the work.
- Raw material enters in line at one end,operations are carried out in succession
- In a smooth flow and the finished product is delivered at the other end of the line
- Used in mass production and repetitive work.

3. Mixed Or Combined Layout:

- Combination of process and line layout is commonly used in industry.
- Combined layout incorporates the benefits of process and product layout.

4. Static Or Fixed Position Layout:

- It is adopted when work piece is very big or too heavy to move from one position to other and is consequently fixed in one place.
- Used in custom ordered type production
- e.g. in construction work , ship building , air craft, pressure vessel, locomotives , etc.

IMPORTANCE OF PLANT LAYOUT

1. Determine the arrangement of facilities and services in the plant
2. Outlines the relationship between production centres and service departments.
3. Outlines the nature of the flow in the plant and affects the distance travelled by materials and personnel.
4. Determines the type of handling systems and machine utilization.
5. Specifies the location , accessibility , and size of stores.
6. Affects the amount of work in process and work awaiting further processing.

PRODUCT DESIGN

- Product design deals with conversion of ideas into reality. Every business organization have to design, develop and introduce new products as a survival and growth strategy.
- Developing the new products and launching them in the market is the biggest challenge faced by the organizations.
- The entire process of need identification to physical manufactures of product involves three functions: marketing, product development, manufacturing.

- Product development translates the needs of customers given by marketing into technical specifications and designing the various features into the product to these specifications.
- Manufacturing has the responsibility of selecting the processes by which the product can be manufactured.
- Product design and developmentprovides link between marketing, customer needs and expectations and the activities required to manufacture the product.

PROCESS DESIGN

- Process design is a macroscopic decision-making of an overall process route for converting the raw material into finished goods.
- These decisions encompass the selection of a process, choice of technology, process flow analysis and layout of the facilities.
- Hence, the important decisions in process design are to analyzed the workflow for converting raw material into finished product and to select the workstation for each included in the workflow.

PRODUCTION PLANNING AND CONTROL

- The principle of production planning and control lies in the statement 'First Plan Your Work and then Work on Your Plan'.
- Main functions of production planning and control includes planning, routing, scheduling, dispatching and follow-up.

- **Planning** is deciding in advance what to do, how to do it, when to do it and who is to do it.
- **Routing** may be defined as the selection of path which each part of the product will follow,which being transformed from raw material to finished products. Routing determines the most advantageous path to be followed.
- **Scheduling** may be defined as'the fixation of time and date for each operation' as well as it determines the sequence of operations to be followed.

- **Dispatching** is concerned with the starting the processes. It gives necessary authority so as to start a particular work, which has already been planned under 'Routing' and 'Scheduling'.

- The function of **follow-up** is to report daily the progress of work in each shop in a prescribed proforma and to investigate the causes of deviations from the planned performance.

QUALITY CONTROL

- Quality Control (QC) may be defined as 'a system that is used to maintain a desired level of quality in a product or service'.
- Quality control can also be defined as 'that industrial management technique by means of which product of uniform acceptable quality is manufactured'. It is the entire collection of activities which ensures that the operation will produce the optimum quality products at minimum cost.