Q1) What are the basic layouts?

Ans) There are four basic layout types: *process, product, group layout*, and *fixed position*.

1. **Process layouts:**

Layouts that group resources based on similar processes or functions. The challenge in process layouts is to arrange resources to maximize efficiency and minimize waste of movement.

**2. Product Layout:**

In this type of layout, machines and auxiliary services are located according to the processing sequence of the product.

**3. Fixed Position Layout:**

This is also called the **project type**of layout. In this type of layout, the material, or major components remain in a fixed location and tools, machinery, men and other materials are brought to this location. This type of layout is suitable when one or a few pieces of identical heavy products are to be manufactured and when the assembly consists of a large number of heavy parts, the cost of transportation of these parts is very high.

**4. Group layout:**

Group technology (GT) is the analysis and comparisons of items to group them into families with similar characteristics. GT can be used to develop a hybrid between pure process layout and pure flow line (product) layout. This technique is very useful for companies that produce a variety of parts in small batches to enable them to take advantage and economics of flow line layout.

**The Advantages of product layout:**

1. The flow of product will be smooth and logical in flow lines.
2. In-process inventory is less.
3. Throughput time is less.
4. Minimum material handling cost.
5. Simplified production, planning and control systems are possible.
6. Less space is occupied by work transit and for temporary storage.
7. Reduced material handling cost due to mechanized handling systems and straight flow.
8. Perfect line balancing which eliminates bottlenecks and idle capacity.
9. Manufacturing cycle is short due to uninterrupted flow of materials.
10. Small amount of work-in-process inventory

**Limitation of product layout**:

1. A breakdown of one machine in a product line may cause stoppages of machines in the downstream of the line.
2. A change in product design may require major alterations in the layout.
3. The line output is decided by the bottleneck machine.
4. Comparatively high investment in equipment is required.
5. Lackofflexibility. A change in product may require the facility modification.

Q)**Explain what is a flexible manufacturing system.**

Ans) A flexible manufacturing system (FMS) is a production method that is designed to easily adapt to changes in the type and quantity of the product being manufactured. Machines and computerized systems can be configured to manufacture a variety of parts and handle changing levels of production.

**Benefits:**

The main benefit is the enhancement of production efficiency. Downtime is reduced because the production line does not have to be shut down to set up for a different product.

**Disadvantages:**

Disadvantages of FMS include its higher upfront costs and the greater time required to design the system specifications for a variety of future needs.

There also is a cost associated with the need for specialized technicians to run, monitor, and maintain the FMS. Advocates of FMS maintain that the increase in automation typically results in a net reduction in labor costs.

Q) What are the components of FMS?

1. Workstations

2. Material handling

3. Computer control system

4. Human resource

**Advantages of process layout:**

1. In process layout machines are better utilized and fewer machines are required.
2. Flexibility of equipment and personnel is possible in process layout.
3. Lower investment on account of comparatively less number of machines and lower cost of general purpose machines.
4. Higher utilization of production facilities.
5. A high degree of flexibility with regards to work distribution to machineries and workers.
6. The diversity of tasks and variety of job makes the job challenging and interesting.
7. Supervisors will become highly knowledgeable about the functions under their department.

**Disadvantages of process layouts:**

1. Backtracking and long movements may occur in the handling of materials thus, reducing material handling efficiency.
2. Material handling cannot be mechanized which adds to cost.
3. Process time is prolonged which reduce the inventory turnover and increases the in- process inventory.
4. Lowered productivity due to number of set-ups.
5. Throughput (time gap between in and out in the process) time is longer.
6. Space and capital are tied up by work-in-process

Q) How do organizations compete against each other?

There are three basic strategies in how an organization competes with one another:

1. **Best price, best value, low cost:**

By providing customers with the best value and lowest cost in the market, the company has won loyal business from people who seek just that.

1. **Innovation:**

This is Apple. Customers will pay more for an Apple product than competing technology because of the company’s strategic edge as an innovator in the market. Apple is innovation.

1. **Customer service:**

Every customer is important — every shopper gets special touches that make buying clothing, shoes or other merchandise at this retailer a pleasure.

**Role of an operation manager:**

An operations manager is key part of a management team and oversees high-level HR duties, such as attracting talent and setting training standards and hiring procedures. They also analyze and improve organizational processes, and work to improve quality, productivity and efficiency.

They are sometimes known as a chief operating officer, or COO.

**Benefits of operation managements:**

**Profitability Management:**

- With proper operations management, executives are able to rely on the activity and find ways to come up with new ideas on how to potentially increase sales.

**Competitive Advantage:**

A business that can manage their operations can get a handle on any key internal and external factors. Internal factors can include operating policies, average attrition rate, and intellectual capital. External factors pertain to the state of economy and any rival strategies. When helping a firm understand internal and external factors, operations management improves the competitive standing of the company.

**Regulatory Compliance:**

Analyzing operating activities enables corporate management to rid themselves of the days of considerably large government fines and adverse regulatory decisions.

**Manufacturing Edge:**

Changing or improving the way a good is produced can save a facility a large sum of money in the long run. With operations management, you are able to change or improve the way a product is made, as well as how to store raw materials more effectively.

**Skills required for an operation manager:**

* 1. Bachelor’s degree in operations management or related field.
  2. Experience in management, operations, and leadership.
  3. Understanding of general finance and budgeting, including profit and loss, balance sheet and cash-flow management.
  4. Ability to build consensus and relationships among managers, partners, and employees.
  5. Excellent communication skills.
  6. Solid understanding of financial management.

**Advantages and disadvantages of operation management:**

**Advantage:**

Operations management can easily aid an organization implement strategic objectives, planning, controlling, strategic processes, and more. A primary focus of operations management includes effectively managing any resources of an organization in order to maximize the potential of any products or services that are offered by the company. Operations management can benefit a company through adequately managing areas of the operation such as human resources, production, inventory, logistics, purchasing, materials management, and more. Overall, operations management is a key factor within manufacturing operations that wish to take their production to the next level.

**Disadvantage:**

One of the main disadvantages of operations management includes its dependence on utilizing many different components to work together and achieve success. Even with an effective plan, operations management will fail if the plan is not carried out in the proper manner. Since humans are mistake prone, this is a prevalent problem within manufacturing operations. Most of the time, this issue occurs most frequently during the transition from manufacturing to sale. Therefore, it is important to ensure that operations management is coordinating various areas effectively such as the operation, marketing, finance, accounting, engineering, information, and human resources. Overall, if the individual components are not working well together, there will only be a limited amount of success within the organization.