

tools, parts. Detailed planning is essential for sequencing the requirements of each product, capacities for each work centre and order priorities.

Higher cost due to frequent set up changes. Higher level of inventory at all levels and hence higher inventory cost. Production planning is complicated. Larger space requirements.

### 8.2.2 Batch Production

Batch production is defined by American Production and Inventory Control Society (APICS) "as a form of manufacturing in which the job passes through the functional departments in lots or batches and each lot may have a different routing." It is characterized by the manufacture of limited number of products produced at regular intervals and stocked awaiting sales.

**Characteristics Batch production system is used under the following circumstances:**

When there is shorter production runs. When plant and machinery are flexible. When plant and machinery set up is used for the production of item in a batch and change of set up is required for processing the next batch. When manufacturing lead time and cost are lower as compared to job order production.

### 8.2.3 Mass Production

Manufacture of discrete parts or assemblies using a continuous process are called mass production. This production system is justified by very large volume of production. The machines are arranged in a line or product layout. Product and process standardization exists and all outputs follow the same path.

**Characteristics Mass production is used under the following circumstances:**

Standardization of product and process sequence. Dedicated special purpose machines having higher production capacities and output rates. Large volume of products. Shorter cycle time of production. Lower in process inventory. Perfectly balanced production lines. Flow of materials, components and parts is continuous and without any back tracking. Production planning and control is easy. Material handling can be completely automatic.

### 8.2.4 Continuous Production

facilities are arranged as per the sequence of production operations from the first operations to the finished product. The items are made to flow through

the sequence of operations through material handling devices such as conveyors, transfer devices, etc.

Characteristics Continuous production is used under the following circumstances:

Dedicated plant and equipment with zero flexibility. Material handling is fully automated. Process follows a predetermined sequence of operations. Component materials cannot be readily identified with final product. Planning and scheduling is a routine action.

### 8.2.5 Just In Time Production (JIT)

This method of production generates goods/services "just in time" for them to be sold rather than preparing them months or weeks in advance. To solve storage costs, the parts needed to make the end product will arrive just before they are used to manufacture the product. This means that the production process is carefully planned and organised. Production must be efficient and speedy otherwise the goods will not be manufactured "in time" for the customer. Conversely if there are no/few orders then production will slow down or stop altogether.

## 8.3 INSPECTION AND CONTROL IN PRODUCTION

### Inspection

Inspection is the most common method of attaining standardization, uniformity and quality of workmanship. It is the cost art of controlling the product quality after comparison with the established standards and specifications. It is the function of quality control. If the said item does not fall within the zone of acceptability it will be rejected and corrective measure will be applied to see that the items in future conform to specified standards.

Inspection is an indispensable tool of modern manufacturing process. It helps to control quality, reduces manufacturing costs, eliminate scrap losses and assignable causes of defective work.

### Stages of Inspection

- (1) Inspection of incoming material
- (2) Inspection of production process
- (3) Inspection of finished goods.
- (1) **Inspection of incoming materials** it is also called receiving inspection. It consists of inspecting and checking of all the purchased raw materials and parts that are supplied before they are taken on to stock or used in actual manufacturing. Inspection may take place either at supplier's end or at manufacturer's gate. If the incoming materials are