INTRODUCTION TO MANUFACTURING PROCESS:—

Manufacturing is the process of production of workpieces having defined geometric shapes and used for useful purposes. These workpieces or articles made from materials and are shaped or formed using different Manufacturing processes.

There are some processes which improve mechanical Properties. In some process material are changed into their primary forms for selected parts. In some cases the materials are suitably finished for commercial use. The selection of the best process for a given product requires a knowledge of all possible production methods.

CLASSIFICATION OF MANUFACTURING PROCESS:—

The manufacturing processes are classified as follows:—

1. Primary shaping or forming Processes.
2. Machining Processes.
3. Joining Processes.
4. Surface Finishing Processes.
5. Deforming Processes.
6. Material properties Modification Process.

Primary shaping or Forming Process:-

Primary shaping or forming is manufacturing of a solid body from a molten or gaseous state or form an amorphous material. Amorphous material includes powder, fibres, chips etc.

Some of the important primary shaping Processes are :-

(i) Casting
(ii) Powder metal forming
(iii) Gas cutting.
(iv) Plastic Technology.
(v) Crushing
(vi) Piercing.

2. Deforming Processes :-

Deforming Processes make use of suitable stress like compression, Tension, shear, Torsion or combination of these stresses to cause plastic deformation of the material in order to produce required shapes without changing its mass or material composition.

Some of the forming processes are :-

(i) Extrusion
(ii) Rolling
(iii) Bending
(iv) Drawing.
(v) shearing
(vi) Forging.
(vii) spinning
(viii) Thread Rolling.

Machining Processes :-

After primary processes, There are large number of products which need further Processing in order to obtain desired shapes and dimensional accuracy. These processes are called secondry process.

In secondry process, material is removed from undesired region by giving or providing relative motion between the workpiece and tool. Some of the machining processes are :-

(i) Turning
(ii) Drilling
(iii) Boring
(iv) Threading
(v) shaping
(vi) Knurling
(vii) Grinding
(viii) Milling.

4. Joining Processes :-

In these processes, two or more Pieces of metal parts are united together to make sub assembly or final product. The joining processes can be carried out by fusing, Pressing, riveting or any other means of assembling. Some of the important joining Processes are :-

(i) soldering
(ii) Brazing
(iii) welding
(iv) screwing
(v) Riveting
(vi) Press Fitting.
(vii) Adhesive Bonding
(viii) Sintering.

Surface Finishing Processes :-

These processes are used to impart intended surface finish on the surface of the product. By imparting a surface finish process, very negligible amount of material is removed and dimension of the product or part is not changed. In some process, certain material is added to the surface of the job.
Some of the processes under this category are :-

(i) Electro plating
(ii) Metallic coating
(iii) Galvanising
(iv) Honing
(v) Parkerising
(vi) Polishing.
(vii) Painting
(viii) Lapping
(ix) Super Finishing
(x) Metal Spraying
(xi) Inorganic coating
(xii) Deburring.

6. Material Properties Modification processes :-

In these processes, some of the material properties are enhanced in order to achieve desirable characteristics.
Some of the important processes under this category are :-

(i) cold working
(ii) Hot working.
(iii) Heat Treatment.
(iv) Annealing.
(v) shot planning.