

## REFERENCE BOOKS

1. Manufacturing Engineering and Technology.  
- Kalpakjian ... for IAS.
2. Manufacturing Processes for Engineering Materials.  
- Kalpakjian ... for GATE.

## SIR'S DETAILS :

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“If you salute your work, you do not have to salute anybody.  
If you pollute your work, you have to salute everybody.”

- APJ Abdul Kalam.

# THEORY OF METAL CUTTING

Ques - Difference b/w production and manufacturing? (INV)

\* Manufacturing is a process of converting raw material into finish product by using various process, machines and energy.  
It is a narrow term.

\* Production is a process of converting inputs into outputs.  
It is a broader terms.

Example!- Crude Oil is a production not manufacturing.  
Movie is a production not manufacturing.

\* Manufacturing and production are often used interchangeably.

## Classification of Manufacturing Process.

\* Shaping or Forming - (Zero Process)

\* Joining Process - (Positive Process)

\* Removal Process - (Negative Process)

\* Regenerative Manufacturing.

↳ Rapid prototyping.

Ques:- what is Regenerative manufacturing or what is Rapid prototyping or what is 3-D printing?

\* Production of solid product in layers by layers from raw materials in different forms.

Liquid - eg - stereolithography (Molten Metal).

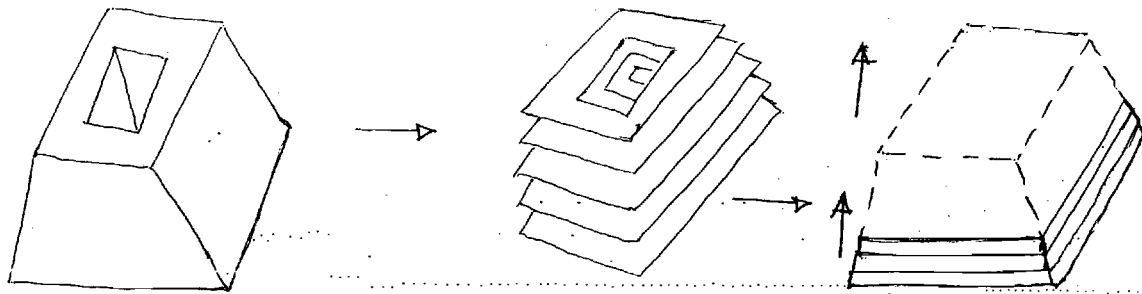
Powder - eg - selective sintering.

Sheet - eg - LOM (Laminated Object Manufacturing)

Wire - eg - FDM (Fused Deposition Modeling).

\* Very rapid, accurate and used for Rapid prototyping and tooling.

# BASIC PRINCIPLE OF REGENERATIVE MCG.



\* Size of single layer is in micron. { 1 micron =  $10^{-6}$  m }

## Machining

Machining is an essential process of finishing by which jobs are produced to the desired dimensions and surface finish by gradually removing the excess material from the preformed blank in the form of chips with the help of cutting tools moved past the work surface.

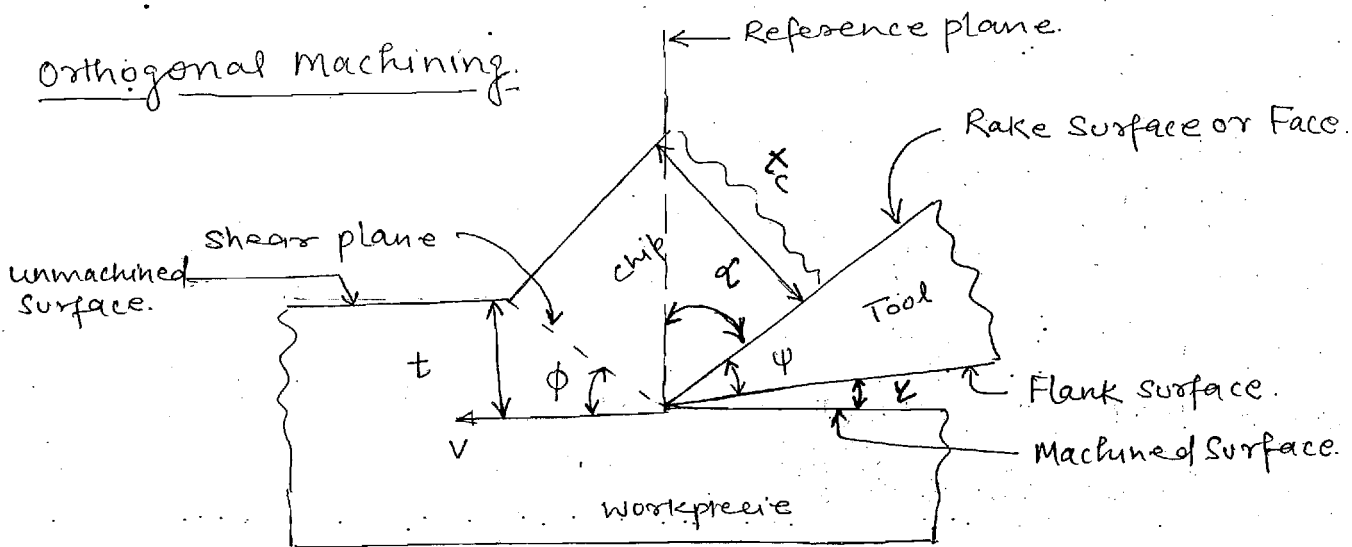
\* Objective of machining

\* Surface Finish

\* Dimensional Accuracy.

\* Machining is a removal process.

## Orthogonal Machining.



Rake Angle =  $\alpha$

clearance Angle  
or  
Relief Angle =  $\psi$

Shear Angle =  $\phi$

Lip Angle or Wedge angle or Kinfe angle  
or cutting angle =  $\psi$