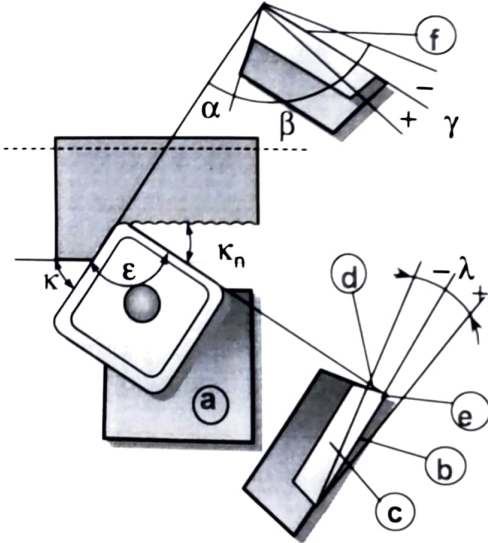


**MEC-E7002 Manufacturing methods I**  
**23.2.2022**

Answer shortly, use clear and readable fonts.

1. Name a) major cutting edge, b) relief (clearance) angle, c) rake angle, d) inclination angle, e) tool nose radius. Explain the effect of each to the cutting forces and tool strength.



2. Explain the following cutting tool wear types and associated mechanisms: a) flank wear, b) crater wear, c) built-up edge.

3. Fill in the following table concerning characteristics of cutting tool materials so, that 1 = largest, 3 = smallest and 2 = in between.

Mater./Char.	Hardness	Toughness	Heat resistance	Density	Modulus of elasticity
Tungsten carbide (WC)					
High speed steel (HSS)					
Ceramic					

4. Describe shortly (Related machine and/or method, resulting product or feature, main characteristics from application point of view):

- Press brake
- Turret punch press
- Spinning
- Hydro forming
- Deep drawing

5. Describe shortly (tool and method, product or resulting feature):

- Reaming
- Hobbing
- Whirling
- Broaching
- Circular grinding