

TUTORIAL CHAPTER 1: A
MANUFACTURING PROCESS AND TECHNOLOGY (MEM 360)

Question 1:

- a) List type of chips produced in metal casting.
- b) List the two operations that can be done using the lathe machine.
- c) Sketch the rake angle and relief angle in mechanics of cutting. Then give one function of each angle.

| | rake angle | relief angle |
|----------|------------|--------------|
| Function | | |
| Sketch | | |

- d) Explain the function of drilling, boring and reaming process.

e) With an aid of diagrams, differentiate between taper turning, profiling and threading process.

f) What distinguishes slab milling from face milling? Explain with the aid of sketches.

| slab milling | face milling |
|--------------|--------------|
| | |
| | |

Question2:

2.1 Sketch the rake angle and relief angle in mechanics of cutting. Then give one function of each angle.

| | rake angle | relief angle |
|----------|------------|--------------|
| Function | | |
| | | |

| | | |
|--------|--|--|
| Sketch | | |
|--------|--|--|

2.2) Make sure you know how to Calculate the MRR or cutting time those statement below ().

- a) A stainless steel rod is being reduced from 48 mm in diameter using lathe machine. The spindle rotate at $N = 500 \text{ rpm}$ and tool is travelling at axial speed of 225 mm/min . Calculate the material removal rate of the process.
- b) A peripheral milling is performed on a rectangular work piece that is 320mm long by 60mm wide and by 56mm thick. The cutter is 65mm in diameter and consists of 4 teeth. The operation reduces the thickness of the piece to 50mm. Surface speed of the cutter = 50 mm/min and chip load = 0.24 mm/tooth . Determine machine time (t) and metal removal rate (MRR) when the cutter reach the full depth.
- c) The technician needs to machine 150mm long rod bar from 65mm to 60mm diameter. The spindle, N is 500 rpm and axial speed of 250 mm/min . Calculate the MRR.
- d) A cylindrical work part 75 mm in diameter and 250mm long is used to be turned in an engine lathe to reduce the diameter to 65mm. Cutting condition are: $V = 35 \text{ m/min}$, $f = 0.5 \text{ mm/rev}$ and depth of cut is 3.00 mm . Determine cutting time and metal removal rate.