



## Homework-6

Student Name: \_\_\_\_\_

Grade:  $\frac{-}{5}$

- 1- Estimate the force required for punching a  $25 \text{ mm}$  diameter hole through a  $\frac{1}{8} \text{ in}$  thick annealed titanium-alloy 5-Al-2.5-Sn sheet at room temperature.



- 2- Estimate the force required for bending an aluminum alloy 5052 sheet of 1 mm thick by using a wiping die. With a length of bend of 200 mm and a width of 60 mm.**



**TABLE 6.3**

Properties of Selected Aluminum Alloys at Room Temperature				
Alloy (UNS)	Temper	Ultimate tensile strength (MPa)	Yield strength (MPa)	Elongation in 50 mm (%)
1100 (A91100)	O	90	35	35–45
1100	H14	125	120	9–20
2024 (A92024)	O	190	75	20–22
2024	T4	470	325	19–20
3003 (A93003)	O	110	40	30–40
3003	H14	150	145	8–16
5052 (A95052)	O	190	90	25–30
5052	H34	260	215	10–14
6061 (A96061)	O	125	55	25–30
6061	T6	310	275	12–17
7075 (A97075)	O	230	105	16–17
7075	T6	570	500	11

**Table 6.3 | Properties of Selected Aluminum Alloys at Room Temperature.**

**TABLE 6.10**

Properties and Typical Applications of Selected Wrought Titanium Alloys at Various Temperatures									
Nominal composition (%)	UNS	Condition	Ultimate tensile strength (MPa)	Yield strength (MPa)	Elongation (%)	Reduction of area (%)	Temp. (°C)	Ultimate tensile strength (MPa)	Yield strength (MPa)
5 Al, 2.5 Sn	R54520	Annealed	860	810	16	40	300	565	450
6 Al, 4 V	R56400	Annealed	1000	925	14	30	300	725	650
		Solution + age	1175	1100	10	20	300	980	900
13 V, 11 Cr, 3 Al	R58010	Solution + age	1275	1210	8	—	425	1100	830

**Table 6.1 | Properties and Typical Applications of Selected Wrought Titanium Alloys at Various Temperatures.**