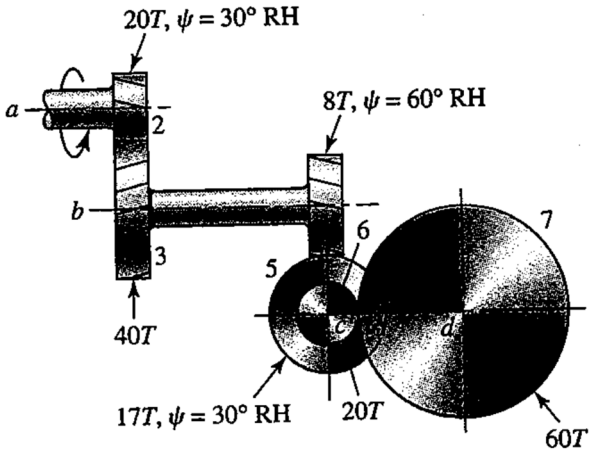
# University of California at Berkeley
# College of Engineering
# Department of Mechanical Engineering

**ME102B, Fall 2018** **Liwei Lin**

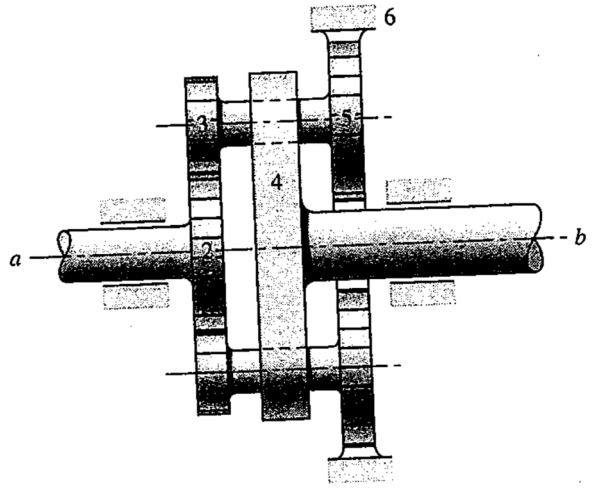
## Problem Set #4

## Due October 31 (Wednesday)

**Problem 1 (Gear Train)**
Shaft a in the figure rotates at 400 r/min in the direction shown. Find the speed of shaft d. You can assume these are spur gears and ignore the tooth angle information.




**Problem 2 (Planetary Gear Train)**
The figure shows a speed reducer in which the input shaft "a" is in line with output shaft "b." The tooth numbers are $N_2 = 20$, $N_3 = 16$, $N_5 = 28$, and $N_6 = 64$. Find the ratio of the output speed to the input speed. Will both shafts rotate in the same direction? Note that gear 6 is a fixed internal gear.



**Problem 3(Gear Force)**
The gears shown in the figure have a diametral pitch of 2 teeth per inch and a 25 degrees pressure angle. The pinion rotates at 1800 rpm, clockwise and transmits 100 hp through the idler pair to gear 5 on shaft c. What forces do gears 3 and 4 transmit to the idler shaft?