**Home work No. (4)**
Gears General Ch.13

Question 1

A 21-tooth spur pinion mates with a 28-tooth gear. The diametral pitch is 3 teeth/in and the pressure angle is 20°. Make a drawing of the gears showing one tooth on each gear. Find and tabulate the following results: the addendum, dedendum, clearance, circular pitch, tooth thickness, and base-circle diameters; the lengths of the arc of approach, recess, and action; and the base pitch and contact ratio.

Question 2

The double-reduction helical gears set shown in the figure is driven through shaft a at a speed of 900 rev/min. Gears 2 and 3 have a normal diametral pitch of 10 teeth/in, a 30° helix angle, and a normal pressure angle of 20°. The second pair of gears in the train, gears 4 and 5, have a normal diametral pitch of 6 teeth/in, a 25° helix angle, and a normal pressure angle of 20°. The tooth numbers are: $N_2 = 14$, $N_3 = 54$, $N_4 = 16$, $N_5 = 36$. Find:
 (a) The directions of the thrust force exerted by each gear upon its shaft
 (b) The speed and direction of shaft c
 (c) The center distance between shafts
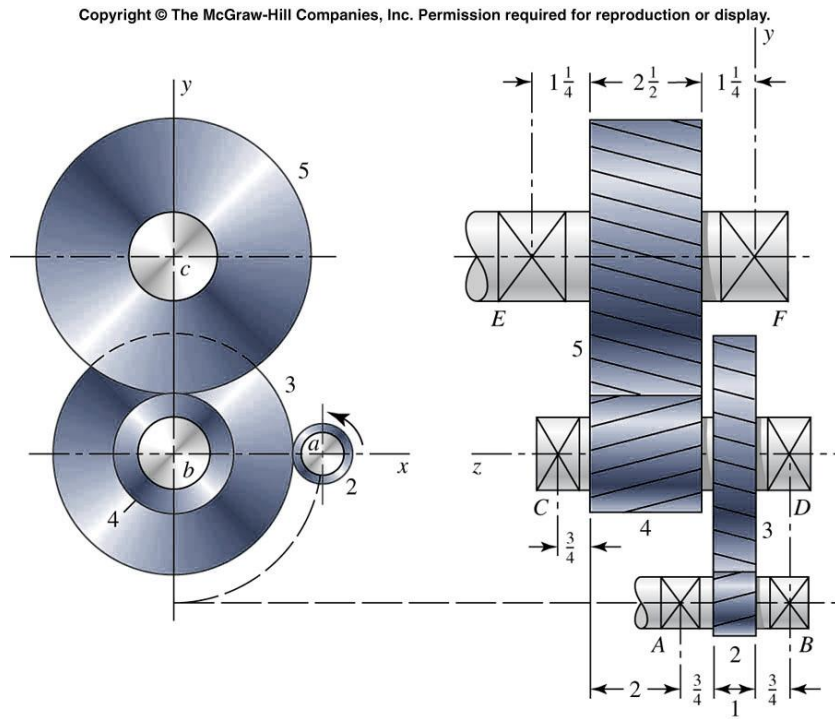
Dimensions in inches.

Question 3

The figure shows a pair of shaft-mounted spur gears having a diametral pitch of 5 teeth/in with an 18-tooth 20° pinion driving a 45-tooth gear. The horsepower input is 32 maximum at 1800 rev/min. Find the direction and magnitude of the maximum forces acting on bearings A, B, C, and D.