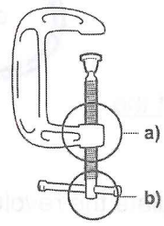
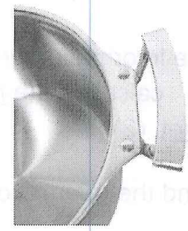
Ch 13 Assignment 2019 ____/25 = % **Name:** _____

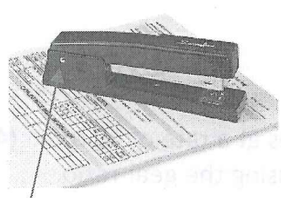
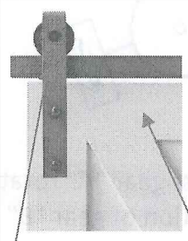
1. Consider the C-clamp and cooking pot shown to the below. Choose the four basic characteristics that best describe the link. (5)



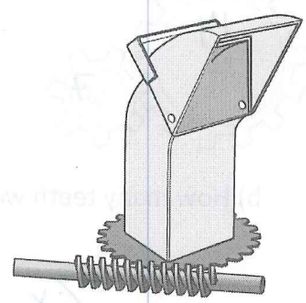


Characteristic	C-clamp "a"	Between handle & pot
Direct or indirect	Direct	Indirect
Rigid or flexible	Rigid	Rigid
Removable or non-removable	non-removable	non-removable
Complete or partial	partial	complete
List the symbol(s) for the degree(s) of freedom of this link?	R_y T_y	No motion

2. Which form of guiding make the following actions possible? (2)

			
Type pf guiding	rotational	rotational translational	helical

3. The motion transmission system on the right is used to direct the chute of a snow blower. (3)



   a) What is this type of motion transmission system called?

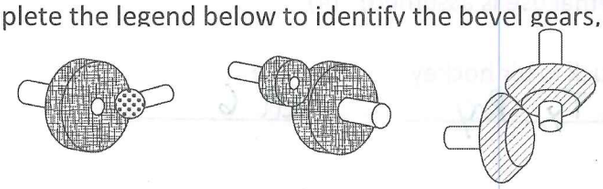
   worm & worm gear system

   b) Name the driver & driven components in this system.

   worm → worm gear

   c) If the snow blower user decides to turn the chute manually, is he/she able to turn it? No

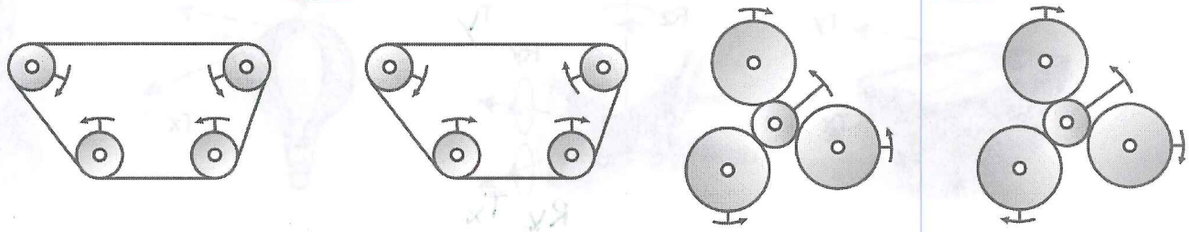
4. Study these friction gears and complete the legend below to identify the bevel gears, the straight gears and the spherical gears. (1)



straight beveled spherical

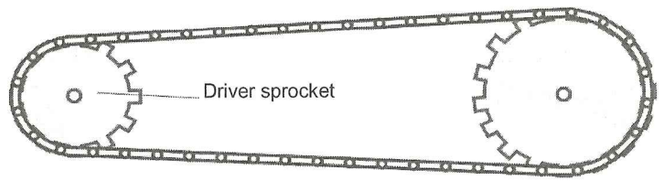
5. Circle the motion transmission **systems** whose rotational motions are correctly illustrated. (2)

a) b) c) d)



You must show work for full marks!

6. In this chain and sprocket system, the rotational speed of the driver sprocket is 120 revolutions per minute.



Based on the information provided **by the illustration**, calculate the rotational speed of the other sprocket. (2)

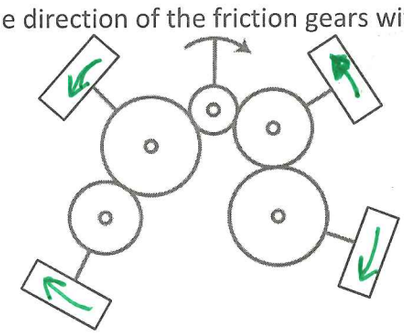
a) First find the gear ratio.

$\frac{\text{driver}}{\text{driven}} = \frac{12}{16} = \frac{3}{4} = 0.75$

b) Calculate the revolutions per minute.

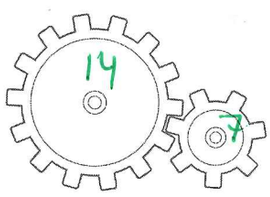
$0.75 \times 120 = 90$ rpm

7. Indicate the direction of the friction gears with an arrow . (2)



8. In the gear train system below, first gear "A" rotates at a rate of 40 rpm. (4)

a) Determine the rate of rotation of gear "B" using the gear ratio.



$\frac{\text{driver}}{\text{driven}} = \frac{14}{7} = 2$

$2 \times 40 = 80$ rpm

b) How many teeth would a 3rd gear have, if it is to rotate at a 1/6 the speed of gear B?

$7 \times 6 = 42$ teeth

9. Determine the degrees of freedom do the following items have and give the symbols. (normal use is assumed) (4)

a) the puck in air hockey: Tx Tz Ry

b) plane: all 6

c) hot air balloon: Tx Ty Tz Ry

d) elevator: Ty