**Homework**

1. Fill in the blanks for the following (20%)
   1. Ratchets give \_\_\_\_\_\_\_\_\_\_\_\_ motions
   2. For ratchets, the \_\_\_\_\_\_\_\_\_\_\_ stops the wheel from slipping back
   3. Drives and Gearing provide \_\_\_\_\_\_\_\_\_\_\_\_\_\_ connections
   4. In friction drives, a \_\_\_\_\_\_\_\_\_\_\_ is often employed to prevent belt slip
   5. An \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a tensioning mechanism is used to take up slack in a belt
   6. In timing belts, the belt has \_\_\_\_\_\_\_\_\_\_\_\_\_ to engage the notches in the pulley wheels
   7. In chain and sprocket drives, \_\_\_\_\_\_\_\_\_\_can be added or removed
   8. Spur gears have the same number of \_\_\_\_\_\_\_\_\_\_\_\_
   9. In a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ drive, the geared wheel meshes with a toothed rack
   10. In a \_\_\_\_\_\_\_\_\_\_\_\_ drive, the shaft has a screw thread that meshes with a toothed wheel
   11. In bevel gears, the 2 wheels mesh at \_\_\_\_\_\_\_\_\_\_\_\_degrees
   12. The \_\_\_\_\_\_\_\_\_\_\_\_ is simpler form of the bevel gear and is easier to fabricate
   13. In bevel gears, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_changes from horizontal to vertical (and vice-versa)
2. Answer the following (10%)
   1. Sketch a friction belt drive where the driving and driven wheels counter-rotate
   2. Sketch a friction belt drive where the driving and driven wheels are rotating in different rotational planes
3. Define (1 to 2 sentences), describe (1 to 3 paragraphs) and provide sketches to support you definitions and descriptions for the following (10%)
   1. Worm Gears
   2. Ratchets used to lift heavy loads
4. Sketch and describe the 4 cycles of an 8-notch ratchet-crank mechanism (10%)