

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

Unit No.

6

**Part I.** Place the letter of the key term next to the correct definition.

Term	Definition
	A kind of gear in which the two gears working together lie in different planes, and have their teeth cut at right angles to the surfaces of two cones whose apices coincide with the point where the axes of the wheels would meet.
	A connected flexible series of links used for fastening or securing objects and pulling or supporting loads.
	One of a set of toothed wheels that work together to alter the relation between the speed of a driving mechanism and the speed of the driven parts.
	The relationship between the number of teeth on two gears that are meshed or two sprockets connected with a common roller chain, or the circumferences of two pulleys connected with a drive belt.
	The ratio between the rates at which the last and first gears rotate.
	Involves using gears/sprockets/pulleys of two different sizes to work together, usually slowing output speed and increasing torque. Desired gear reductions can be accomplished in one or multiple stages.
	A gear is different from a pulley in that a gear is a round wheel which has teeth that mesh with other gear teeth, allowing force to be fully transferred without slippage.
	Any of various toothlike projections arranged on a wheel rim to engage the links of a chain.
	These are the simplest, and probably most common, type of gear. Their general form is a cylinder or disk. The teeth project radially, and with these "straight-cut gears," the leading edges of the teeth are aligned parallel to the axis of rotation. These gears can only mesh correctly if they are fitted to parallel axles.
	This is a gear that resembles a screw. It is a type of helical gear, but its helix angle is usually somewhat large (that is, close to 90 degrees) and its body is usually fairly long in the axial direction; and it is these attributes that give it its screwlike qualities. A worm is usually meshed with an ordinary looking, disk-shaped gear, which is called the gear, the wheel, the worm gear, or the worm wheel. The prime feature of this gear set is that it allows the attainment of a high gear ratio with few parts in a small space.

- A.** Gear Reduction    **B.** Bevel Gear    **C.** Gear Teeth    **D.** Worm Gear  
**E.** Spur Gear    **F.** Gear    **G.** Sprocket    **H.** Gear Ratio    **I.** Chain  
**J.** Gear ratio in a gearbox or transmission

## **Part II. Fill in the blanks.**

Gears improve upon the wheel by using projections called \_\_\_\_\_ that are designed to contact the \_\_\_\_\_ of another gear - transferring motion and force to the other gear. When gear teeth fit together in this manner they are said to be \_\_\_\_\_.

The gear transmitting the force or motion is called the *input* or \_\_\_\_\_ gear and the gear connected to the drive gear is called the *output* or \_\_\_\_\_ gear.

The most important mechanical feature of gears is that gears of unequal size can be combined to produce what is called a mechanical advantage, resulting in a change of rotational speed (measured in \_\_\_\_\_) and torque of the second gear. This is quantified as a gear \_\_\_\_\_.

\_\_\_\_\_ gears are used primarily to transfer speed and torque between parallel shafts.

\_\_\_\_\_ gears are conical-shaped gears used in machines where a change in the output shaft's direction is desired. The teeth are the same basic shape as a spur gear's teeth, but have a slight taper towards the apex of the cone.

\_\_\_\_\_ gears are used to transmit power between two shafts that are at right angles to each other. They are frequently used where a large speed reduction or large mechanical advantage is required in a limited space.

For each \_\_\_\_\_ in torque, there is an equivalent speed reduction; for each \_\_\_\_\_ in torque, there is an equivalent speed increase.

Gears can be inserted between the driving and driven gears. These are called \_\_\_\_\_ gears, and they have no effect on the robot's gear ratio because their gear ratio contributions always cancel themselves out. However, idler gears do \_\_\_\_\_ the direction of rotation.

\_\_\_\_\_ gears are formed when you have more than one gear on the same axle.

\_\_\_\_\_, although similar in appearance to gears from a distance, are distinctly different in design and use. Gears are designed to mesh directly with each other, while these are designed for meshing with a chain to transfer power.

\_\_\_\_\_ chain is the most commonly used type of chain. It typically consists of rollers cushioned by bushings held in place by pins. These in turn are held in place by a set of roller link plates that are sandwiched between two link plates.

**Part III.** Place the letter of the Inventor technical term next to the correct definition.

Term	Description
	Calculates dimensions and checks strength of external and internal gearing with straight and helical teeth. It contains geometric calculations for designing different types of correction distributions, including a correction with compensation of slips.
	Use these when creating axes, sketch planes, or termination planes, or to position cross-sectional views or cutting planes. Use this: <ul style="list-style-type: none"><li>• When a part face is not available as a sketch plane for sketching new features.</li><li>• When an intermediate position is required to define other work planes (for example, at an angle to a face at an offset distance).</li></ul>
	This consists of the sketch plane, a coordinate system, 2D curves, and the dimensions and constraints applied to the curves.
	Projects geometry (model edges, vertices, work axes, work points, or other sketch geometry) onto the active sketch plane as reference geometry.
	Creates a circle from a center point and radius, or tangent to three lines.
	Adds dimensions to a sketch. Dimensions control the size of a part. They can be expressed as numeric constants, as variables in an equation, or in parameter files.
	Used to create rectangles two ways: specifying diagonal corners or specifying length and width. Each rectangle side is a line segment.
	A geometric constraint that positions selected lines, ellipse axes, or pairs of points parallel to the Y-axis of the sketch coordinate system (same X coordinate).
	This constraint causes lines, ellipse axes, or pairs of points to lie parallel to the X axis of the sketch coordinate system.
	A geometric constraint that causes selected arcs and circles to have the same radius or selected lines to have the same length.
	Placed features that round off or cap interior or exterior corners or features of a part.
	Use to mirror sketch geometry across a centerline.
	Part, surface, and assembly features can be arranged in a pattern to represent hole patterns or textures, slots, notches, or other symmetrical arrangements.

	These bevel part edges in both the part and assembly environments. They may be equal distance from the edge, a specified distance and angle from an edge, or a different distance from the edge for each face.
	One or more features that can be saved and reused in other designs. You can create these features from any sketched feature that you determine to be useful for other designs. Features dependent on the sketched feature are included in this. After you create an _____ and store it in a catalog, you can place it in a part by dragging it from Windows Explorer and dropping it in the part file or by using the Insert _____ tool.

- A.** General Dimension    **B.** Spur Gear Generator    **C.** Chamfer    **D.** Mirror  
**E.** Work Plane    **F.** iFeature    **G.** 2D Sketch    **H.** Equal Constraint  
**I.** Two Point Rectangle    **J.** Vertical Constraint    **K.** Project Geometry    **L.** Fillet  
**M.** Horizontal Constraint    **N.** Center Point Circle    **O.** Rectangular Pattern