

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

Unit No.

5

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

| Term | Definition  |
|------|---|
|      | A change in speed over time.  |
|      | A placed feature that bevels a part edge and is defined by its placement, size, and angle.  |
|      | An electric rotating machine energized by direct current and used to convert electric energy to mechanical energy.  |
|      | An electric current flowing in one direction only.  |
|      | Accelerations are caused by _____. For example, when a robot is accelerating it does so because of the _____ its wheels exert on the floor                                      |
|      | A slot for a key in the hub or shaft of a wheel. This permits the shaft and wheel to turn together.   |
|      | Energy that is produced by mechanical, electrical, or other means and used to operate a device OR the time-rate of doing work, measured in watts or less frequently horsepower. |
|      | An undercut on a shaft. Typically used between the shoulder of a shaft and a threaded section. This makes it easier to cut a thread on a shaft.                                 |
|      | Often referred to as a drive shaft. A mechanical device for transferring power from the engine or motor to where it is wanted.  |
|      | Measure of how fast an object is moving; that is, how much distance it will travel over a given time.   |
|      | The application of force where there is rotational motion.  |
|      | The measure of a force exerted over a distance.   |
|      | Flat surfaces cut on opposite sides of a shaft. These flats are sized for standard wrench openings and allow for assembly of the shaft.   |

**A.** Wrench flat   **B.** Keyway   **C.** Speed   **D.** Force   **E.** Power   **F.** Shaft  
**G.** Work   **H.** Torque   **I.** Relief   **J.** DC motor   **K.** Acceleration   **L.** Direct current (DC)  
**M.** Chamfer

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

Speed is a measure of how fast an object is moving, that is how much \_\_\_\_\_ it will travel over a given \_\_\_\_\_. This measure is given in units distance per time (some common ones include miles per hour or feet per second).

Speed can be expressed rotationally as well. This refers to how fast something is moving in a \_\_\_\_\_. It is measured in units of angular-distance per time or rotational cycles per time. Common examples include degrees per second or revolutions per \_\_\_\_\_(RPM).

A change in speed over time is known as \_\_\_\_\_; the higher the \_\_\_\_\_ the faster the change in speed. If something is moving at a constant speed, this is not occurring.

\_\_\_\_\_ are caused by forces. When you press on something you are exerting a force on it. When a robot is \_\_\_\_\_ it does so because of the force its wheels exert on the floor. Force is measured in units such as pounds and newtons.

Force directed in a \_\_\_\_\_ is called torque. Torque is a spinning force but in the instance of a wheel, this spinning force will create a linear force at its edge; this is how we define torque, as a linear force at the edge of a \_\_\_\_\_. Torque is described by the magnitude of the force multiplied by the distance it is from the center of rotation (Force x Distance = Torque). Torque is measured commonly in units of inch-pounds and newton-meters.

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

| Term | Description  |
|------|--|
|      | Use to design the shape of a shaft, add and calculate loads and supports, and other calculation parameters. Perform a strength check and generate the shaft in the Autodesk Inventor model. The shaft is assembled from single sections (cylinder, cone, and polygon) including features (chamfers, fillets, neck-downs, and so on). |
|      | Use to create threads on existing model features.<br>Custom thread designations are stored within thread and hole features in the model and may be recovered in a drawing hole or thread note. In shaded drawing views, threaded features are depicted the same as in the part model.  |
|      | Use Return to quit in-place editing and quickly return to the desired environment. The destination depends on which modeling environment you are working in.   |
|      | Assembly constraints determine how components in the assembly fit together. As you apply constraints, you remove degrees of freedom, restricting the ways components can move.   |

**A.** Constraint    **B.** Thread    **C.** Shaft Generator    **D.** Return