Specific Competencies and Skills Tested in this Assessment:

**Basic Drawing Skills**
- Identify and demonstrate appropriate use of drafting tools, materials, and equipment
- Demonstrate knowledge of the use of CAD as a drafting tool
- Drawing standards and conventions
- Utilize appropriate drawing layout and scale
- Complete annotation on drawings
- Complete a title block
- Demonstrate sketching skills and techniques

**Geometric Construction**
- Identify geometric terms and constructions
- Produce basic geometric constructions
- Construct lines at any given angle
- Construct geometric shapes and plane figures
- Draw straight and curved lines

**Applied Mathematics**
- Perform basic mathematic operations
- Apply methods of measurement
- Calculate distance, area, and volume
- Calculate fractions and decimals
- Demonstrate conversion skills
- Calculate taper and slope
- Demonstrate knowledge of algebraic equations
- Demonstrate knowledge of geometry
- Demonstrate knowledge of trigonometry

**Dimensioning Skills**
- Apply fundamental dimensioning features
- Apply local and general notes
- Interpret and apply abbreviations and symbols
- Demonstrate metric dimensioning
- Demonstrate dual dimensioning
Technical Drafting – PILOT (continued)

**Dimensioning Skills (continued)**
Demonstrate tabular dimensioning
Demonstrate baseline dimensioning
Demonstrate tolerancing practices
Identify finished surfaces
Demonstrate GD&T (geometric dimension and tolerancing)

**Multiview Drawing**
Construct basic orthographic views
Produce auxiliary views
Produce section views
Construct intersections and developments
Construct schematic drawings
Develop pictorial drawings
Visualize and produce detailed working drawings
Produce assembly drawings
Demonstrate drawing revisions and modifications

**Threads and Fasteners**
Identify and apply threaded fastener terminology and symbols
Identify and apply screw thread terminology and symbols
Produce threaded fastener drawings
Select appropriate applications for fasteners (e.g., keys, rivets)

**Manufacturing Processes**
Adhere to safe manufacturing operations and OSHA guidelines
Identify and adhere to appropriate use of PPE (Personal Protective Equipment)
Identify the importance and utilization of MSDS (Material Safety Data Sheets)
Demonstrate and apply knowledge of welding and welding symbols
Demonstrate knowledge of various machining processes
Demonstrate knowledge of various materials
Identify standard shop tools and equipment
Demonstrate knowledge of mechanical components (e.g., cams, jigs, bushings)

**Design Principles**
Explain design guidelines (e.g., form, function, repetition)
Identify steps of the design process and cycle
Research and design a project
Use reference materials efficiently
Written Assessment:

Administration Time: 3 hours
Number of Questions: 212

Areas Covered:

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Drawing Skills</td>
<td>11%</td>
</tr>
<tr>
<td>Geometric Construction</td>
<td>10%</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>19%</td>
</tr>
<tr>
<td>Dimensioning Skills</td>
<td>18%</td>
</tr>
<tr>
<td>Multiview Drawing</td>
<td>14%</td>
</tr>
<tr>
<td>Threads and Fasteners</td>
<td>7%</td>
</tr>
<tr>
<td>Manufacturing Processes</td>
<td>15%</td>
</tr>
<tr>
<td>Design Principles</td>
<td>6%</td>
</tr>
</tbody>
</table>

Sample Questions:

Which of the following is a coordinate system?
A. Baseline
B. Cartesian
C. Trigonometric
D. Datum

A smooth curve created through a set of points is called a
A. straight line
B. perpendicular bisector
C. spline
D. polygon

Use _______ as metric units of measurements for dimensioning a working drawing.
A. centimeters
B. millimeters
C. meters
D. kilometers

Which type of screw thread is the most common in the United States?
A. Whitworth
B. Unified
C. Sharp
D. Worm

A part that is formed by pressing thin material down into a die block is called a
A. stamping
B. forging
C. machine part
D. weldment
**Technical Drafting – PILOT (continued)**

**Performance Assessment:**

Administration Time: 3 hours and 15 minutes  
Number of Jobs: 4

**Areas Covered:**

31% **Visualization**  
Sketching: isometric sketches – missing top view, missing right side view, and time to complete Job 1.

45% **Orthographic Drawing**  
Dimensioning, scale, line type, cutting plane line, orientation, and location, appropriate areas hatched, correct placement of views, feature presentation, correct use of line types, geometric dimensioning, drawing information, and time to complete Job 2.

12% **Development**  
Accurately developed (unfolded) pattern and time to complete Job 3.

12% **Assembly – Bill of Material**  
Bill of material and time to complete Job 4.

**Sample Job:** Assembly – Bill of Material

**Maximum Job Time:** 15 minutes

**Participant Activity:** The participant will examine the pictorial drawing and develop a bill of material with all appropriate information from the supplied assembly drawing.