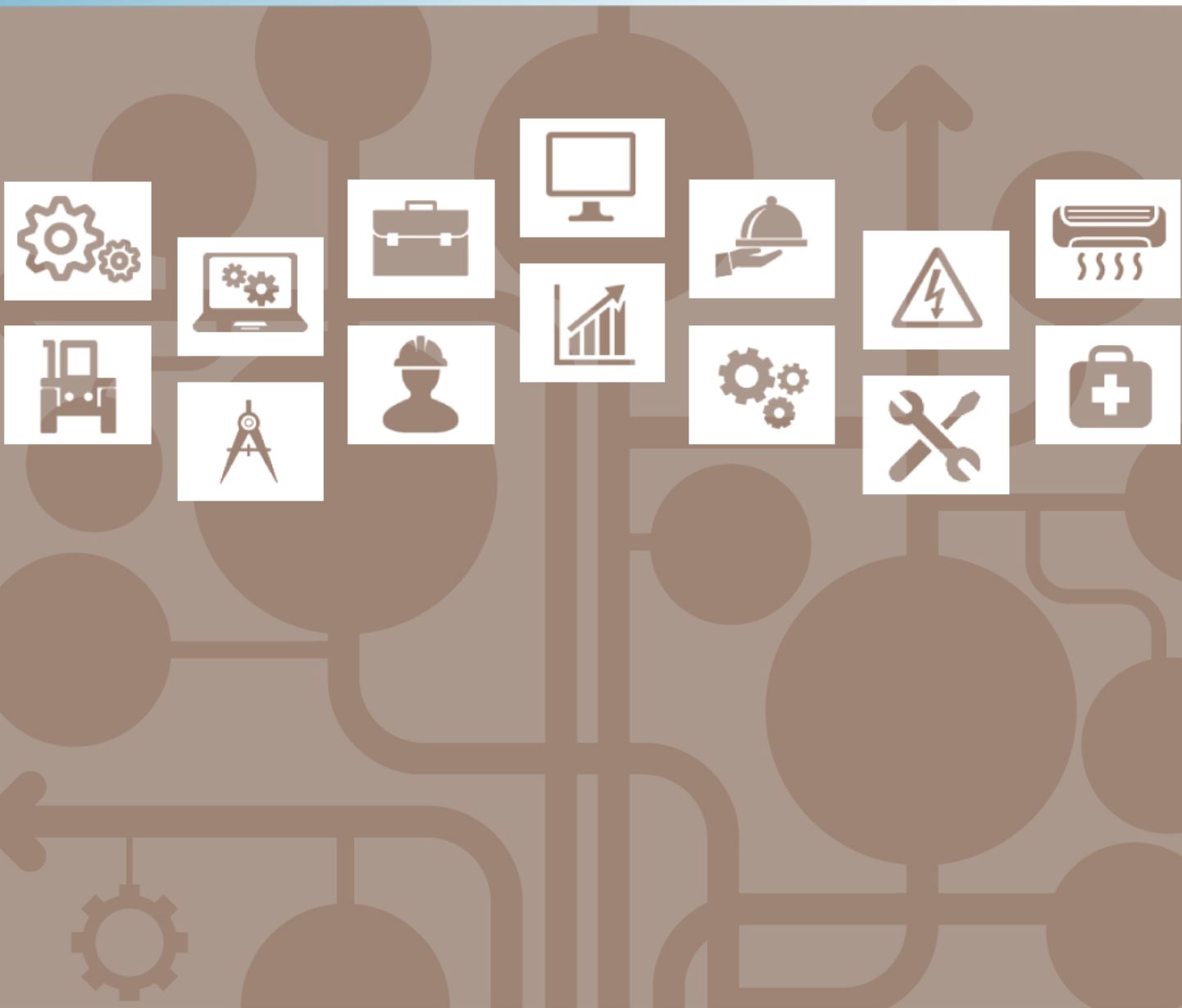




Entry Level Assessment Blueprint

Pre-Engineering/Engineering Technology



Test Code: 3475 / Version: 01

Specific Competencies and Skills Tested in this Assessment:

Safety

- Exhibit knowledge of appropriate personal safety procedures
- Describe the role of OSHA in the technical workplace
- Describe the use of standard safety equipment
- Select the appropriate safety equipment

Design Process/Problem Solving

- Identify principles of the problem solving process
- Outline the steps in the design process
- Translate word problems into mathematical statements
- Describe the importance of team participation in the design process
- Analyze solutions, identifying strengths and weaknesses
- Develop details of a solution
- Develop, test, and redesign prototypes

Manufacturing

- Identify common manufacturing operations (e.g., casting, molding, welding, finishing)
- Select appropriate hand tools for specific applications
- Select appropriate fasteners for specific applications
- Estimate and measure the size of objects using SI and US customary units
- Select appropriate measuring tools for specific applications
- Explain the role of quality control in manufacturing (e.g., tolerancing, datums, dimensioning)
- Distinguish between automated manufacturing control systems (e.g., PLCs, robotics, AGVs)

Assembly and Fabrication

- Explain the role of quality control in assembly and fabrication
- Differentiate between insourcing and outsourcing
- Identify the order and methodology of the assembly process



Specific Competencies and Skills continued:

Materials

- Identify common materials
- Compare and contrast physical properties of materials
- Select correct materials for specific functions

Engineering Systems

- Solve problems using vectoring (i.e., predict resultant forces)
- Identify common forces that act on materials (e.g., torsion, shear, compression)
- Demonstrate the effect of electrical components within an electrical system
- Apply Ohm's Law, Watt's Law, and Kirchoff's Law
- Identify series, parallel, and combination circuits
- Apply knowledge of AC and DC systems
- Demonstrate the effect of resistance in a fluid system
- Apply knowledge of hydraulic, pneumatic, and mechanical systems
- Identify heat transfer methods
- Convert engineering measurements between different unit systems
- Compare/contrast conductors and insulators
- Solve thermal problems using appropriate units
- Determine appropriate uses of digital and analog systems

Communication and Teamwork

- Read and understand design documentation and technical manuals
- Write technical reports
- Deliver an oral presentation
- Express data in tables, graphs, and charts

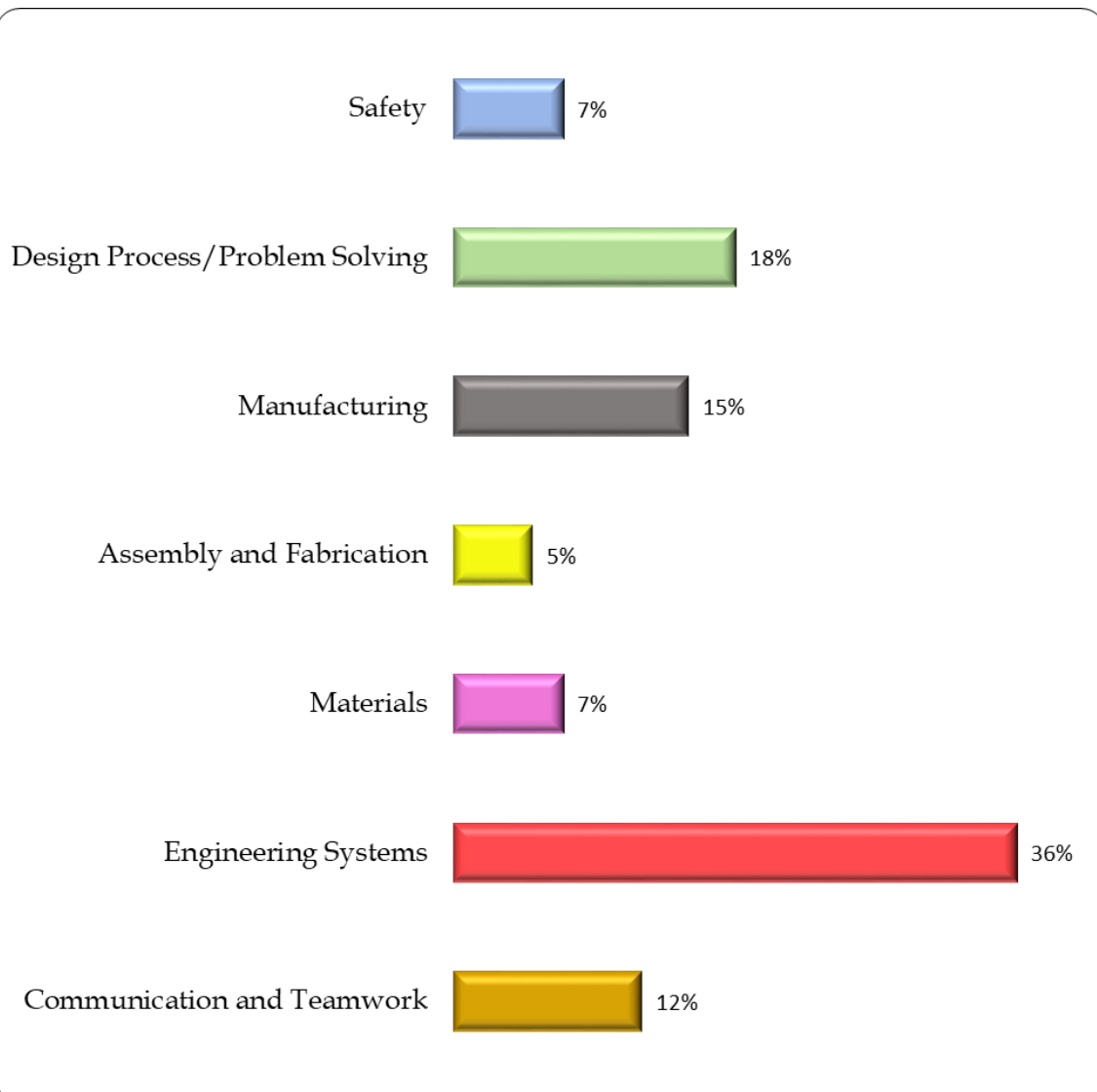
Written Assessment:

Administration Time: 3 hours

Number of Questions: 175

Areas Covered:

7%	Safety
18%	Design Process/Problem Solving
15%	Manufacturing
5%	Assembly and Fabrication
7%	Materials
36%	Engineering Systems
12%	Communication and Teamwork



Sample Questions:

Immediately report the malfunction of any piece of equipment to

- A. other employees
- B. a safety engineer
- C. the supervisor
- D. OSHA

One creative method of increasing the number of engineering design alternatives is

- A. computer-aided design
- B. computer-aided manufacturing
- C. brainstorming
- D. optimizing

Consensus is

- A. agreeing on a proposed solution
- B. disagreeing on a proposed solution
- C. participating in the census
- D. reviewing the proposed solution

The technician should use a _____ to cut a keyway in a shaft.

- A. milling machine
- B. lathe
- C. surface grinder
- D. jig grinder

The acronym, OEM, refers to

- A. Only Electrical Manufacturers
- B. Original Equipment Manufacturer
- C. Operations Efficiency Monitoring
- D. Open Equipment Manufacturing

Performance Assessment:

Administration Time: 3 hours and 30 minutes

Number of Jobs: 2

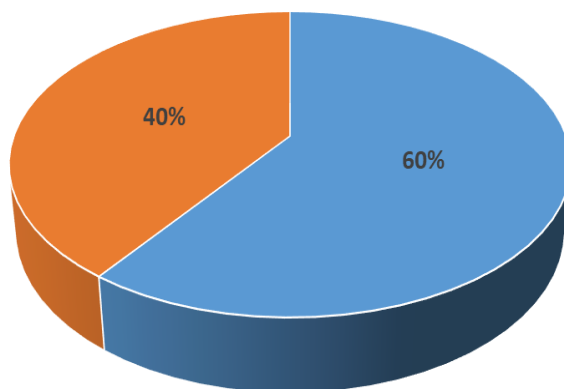
Areas Covered:

60% Technical Writing

Participant will identify a problem or need, evaluate alternatives, design a solution, test the solution, analyze the results, draw conclusions and format the report correctly.

40% Oral Presentation

Participant will give a presentation within the allotted time. Presentation will include; correct number of slides following the technical report, a slide with a chart or table, a question and answer period, and good overall presentation style.



Sample Job: Oral Presentation

Maximum Time: 1 hour

Participant Activity: The participant will prepare and present a 5-minute oral presentation on the previously prepared technical report.

