Name: _____ **Class:** _____ **Date:** _____ **ID: A**

POE Practice Test - Engineering & Design

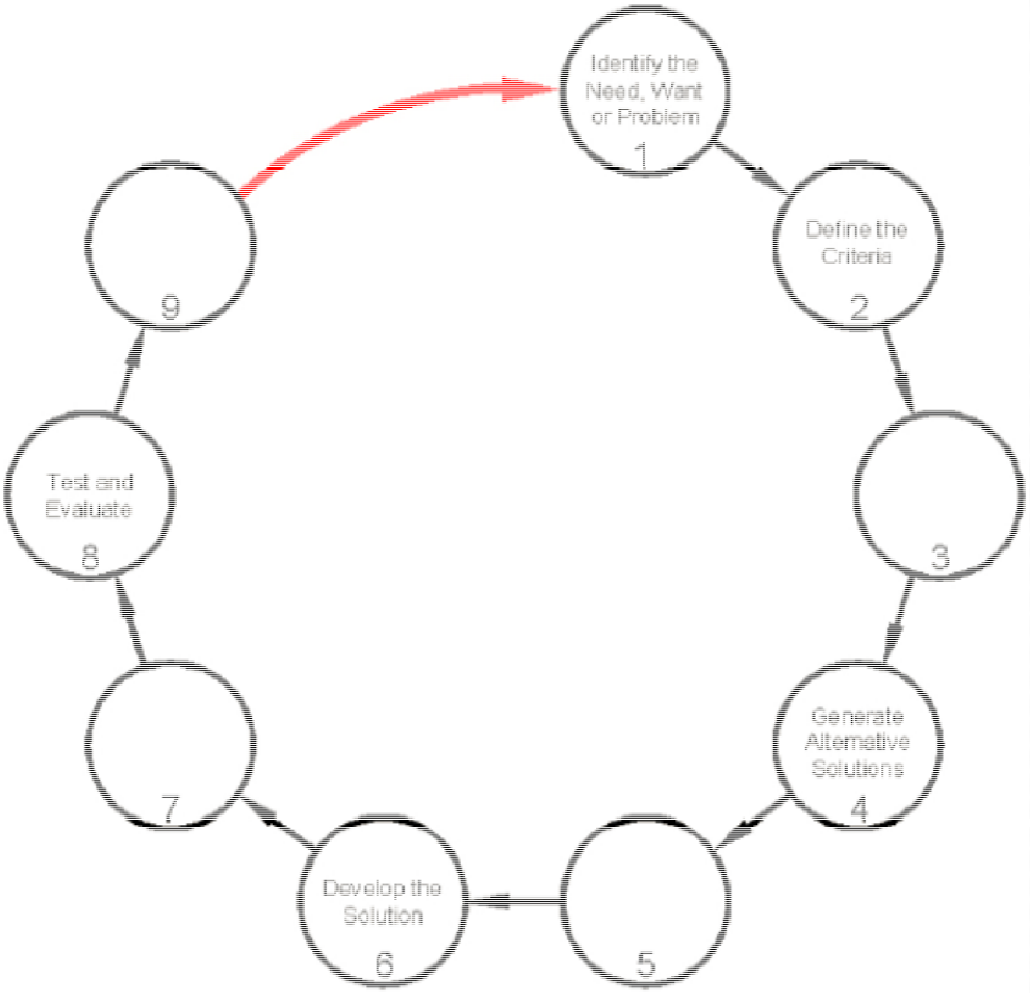
Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. The statement that **best** describes the design process for a product is _____.
   a. a complex process that requires computer models
   b. a process that is performed once
   c. a process that is repeated several times
   d. a process that guarantees success
2. Maximum cost, maximum weight, and maximum volume are all examples of _____ in the design process.
   a. headaches
   b. variables
   c. constraints
   d. definitions
3. The first step in the design process is to
   a. Choose a solution
   b. Prepare a design brief
   c. Define the problem
   d. Develop alternative solutions
4. Skills that are critical for a good engineer include _____
   a. sketching
   b. communication
   c. technical writing
   d. all of the above
5. Which of the following engineering achievements occurred first?
   a. Development of the catapult.
   b. Development of methods to create fire at will.
   c. Development of stone bridges that incorporated wood stringers.
   d. Development of the water wheel.
6. Compared to engineering technology, engineering _____ at the college level.
   a. requires more electives
   b. requires a co-op experience
   c. has a greater focus on teamwork
   d. has a greater focus on theory
7. _____ is freehand drawing, which is done without the use of drafting equipment.
   a. CAD
   b. Dodging
   c. Sketching
   d. Board drafting
8. Design is _____.
   a. a plan or process that is used as a guide in the development of solutions to problems.
   b. a tool that is used only by engineers.
   c. a computer software program that is used by engineers to generate 3-dimensional models of solutions.
   d. a method of generating ideas through unrestrained spontaneous group discussion.
9. Four common causes of product failure are poor design, poor construction, poorly communicated operating instructions, and _____
   a. insufficient power supply.
   b. electronics failure.
   c. operator error or misuse.
   d. excessive mathematical analysis.

Name: _____ **ID: A**

Problem

10. The image below identifies a 9-step design process in which four of the steps have been omitted. Write the answer letter for the correct process step from the answer bank in the proper location within the graphic.



Answer Bank

Answer	Process Step
A	Model and Prototype
B	Choose a Solution
C	Redesign and Improve
D	Investigate and Research

11. Each of the following four statements represents a step in a design process. There are nine design process steps listed in the answer bank. Identify which of the steps from the answer bank is being represented by each statement by writing the step number on the line provided.

a. A team of Principles of Engineering students spent half of a class period debating which one of their initial sketches would be worth pursuing.

Identify the step in the design process: _____

b. A team of Principles of Engineering students downloads their control program to the computer interface device on their marble-sorting machine. The machine proceeds to sort marbles with 30% overall accuracy.

Identify the step in the design process: _____

c. A team of Principles of Engineering students modifies a section of their marble-sorting machine that is not working correctly.

Identify the step in the design process: _____

d. A team of Principles of Engineering students uses the internet to gather information about how a phototransistor functions as a digital switch.

Identify the step in the design process: _____

Answer Bank

Step #	Design Process Step Description
1	Identify the Problem
2	Define the Criteria
3	Research and Investigate
4	Generate Alternative Solutions
5	Choose a Solution
6	Refine and Develop the Solution
7	Model and Prototype the Solution
8	Test and Evaluate the Solution
9	Redesign and Improve the Solution