Exam Topics

I. SECTION I: INTRODUCTION TO MACHINING.
   • Introduction to Machining.
   • Careers in Machining.
   • Workplace Skills.

II. MEASUREMENT, MATERIALS, AND SAFETY.
   • Introduction to Safety.
   • Measurement Systems and Machine Tool Math Overview.
   • Semi-Precision Measurement.
   • Precision Measurement.
   • Quality Assurance, Process Planning, and Quality Control.
   • Metal Composition and Classification.
   • Heat Treatment of Metals.
   • Maintenance, Lubrication, and Cutting Fluid Overview.

III. JOB PLANNING, BENCHWORK, AND LAYOUT.
   • Understanding Drawings.
   • Layout.
   • Hand Tools (Safety Integration).
   • Saws and Cut-Off Machine.
   • Offhand Grinding.
   • Drilling, Treading, Tapping and Reaming.
IV. TURNING.
   • The Lathe.
   • Work and Tool Holding Devices.
   • Machining Operations on the Lathe.
   • Threading.
   • Taper Turning.

V. DRILL PRESS.
   • Sizes and Types of Drill Presses.
   • Drills, Reamers, Countersinks and Counterbores.
   • Work Holding Devices.
   • Drill Press Operation.

VI. MILLING.
   • Major Parts.
   • Vertical Milling Machine Cutter.
   • Work Holding Devices.
   • Drills and Drilling.
   • Squaring a Work Piece on the Milling Machine.
   • Milling Slots and Key Ways.
   • Pocket Milling.
   • Milling Angels, Radii and Diameters.

VII. GRINDING.
   • Surface Grinders and Grinding Wheels.
   • Grinding Wheels.

VIII. COMPUTER NUMERICAL CONTROL.
   • CNC Basics.
   • CNC Turning: Getting Started.
   • CNC Turning: Programming.
   • CNC Turning: Set-up and Operation.
   • CNC Milling: Getting Started.
   • CNC Milling: Programming.
   • CNC Milling: Set-up and Operation.
   • Computer Aided Design and Computer Aided Machining.

Sample Questions
1. The ________ knob is gripped by a power-actuated drawbar mechanism in the machine spindle to secure the mating tapers.
   a. BT
   b. chuck
   c. retention
   d. collet
2. The individual lines and arcs that represent the outline of the part’s shape are called ________.
   a. models
   b. surfaces
   c. entities
   d. frames

3. ________ are often responsible for measuring sizes to ensure parts meet specifications shown on engineering drawings.
   a. Assemblers
   b. Operators
   c. Technicians
   d. Machinists

4. A(n) ____________ is a visual summary of your experience and achievements.
   a. career portfolio
   b. outline
   c. cover letter
   d. greeting

5. A vernier ________ gage is like a caliper mounted on a solid base for use on a surface plate.
   a. plug
   b. pin
   c. go plug
   d. height

6. Aluminum alloys are usually identified by ______ or IADS numbers.
   a. UNS
   b. ANMA
   c. AL
   d. AA

7. Nitriding heats steel in a sealed furnace containing nitrogen gas at about ________ to add carbon to the steel and cause hardening.
   a. 800°F
   b. 900°F
   c. 1000°F
   d. 1050°F
8. ________ wheels are gray in color and can be used on pedestal, bench, and tool grinders.
   a. Silicon carbide
   b. Diamond-impregnated
   c. Aluminum oxide
   d. Carbon

9. Feed per tooth is also called ________ load.
   a. boring
   b. climbing
   c. chip
   d. tram

10. ________ vises are the most commonly used workholding devices for milling because they are highly versatile, accurate, and simple to use.
    a. Clamp
    b. Step
    c. Machine
    d. Toggle