**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Technology Education  
Career & Technical Education  
Desert Hills Middle School  
  
Engineering Technology 1st Quarter Exam Study Guide**

**Directions:** Answer each of the questions to the best of your ability. Write a question mark next to the questions you aren’t sure about. When we correct the study guide in class, raise your hand to ask questions about the items you marked with a question mark.

**General Lab Safety**

1. **True or False** (circle one): Womens flats are OK to wear in the shop because they cover the toes.
2. **True or False** (circle one): If a machine is damaged or not working, you should report it to the teacher immediately.
3. Which of the following is **NOT** a necessary part of personal protective equipment that should be worn in the shop every day?
   1. Safety glasses
   2. Close-toed shoes
   3. Gloves
   4. Hair ties for long hair
4. Which of the following clothing items may **NOT** be worn in the shop?
   1. Dangling earrings
   2. Stud-type earrings
   3. Rolled-up long sleeves
   4. Jeans
5. Which of the following are potential consequences for repeated failure to adhere to all shop rules?
   1. Verbal Warning and loss of Teamwork & Safety points
   2. Contact with parent/guardian
   3. Permanent removal from the class
   4. All of the above

**Tool & Machine Safety**

1. **True or False** (circle one): It’s okay to use a machine you have not passed the safety test for as long as you have used it before and know how to use it safely.
2. **True or False** (circle one): Failure to properly follow all machine-specific safety rules can result in damage to the machines or serious personal injury.
3. **True or False** (circle one): When using a drill press, it is acceptable to just use the fastest speed no matter what material is being bored.
4. Which of the following machines uses a long, looped blade spinning between two large wheels to cross-cut, resaw, and rip various kinds of stock?
   1. Band Saw
   2. Scroll Saw
   3. Drill Press
   4. Disc/Belt Sander
5. Which of the following machines uses a flat, spinning abrasive wheel or belt to smooth material?
   1. Band Saw
   2. Scroll Saw
   3. Drill Press
   4. Disc/Belt Sander
6. Which of the following machines uses a short, thin blade in a reciprocating motion to make fine, detailed cuts and narrow radius cuts?
   1. Band Saw
   2. Scroll Saw
   3. Drill Press
   4. Disc/Belt Sander
7. Which of the following machines uses a rotating bit for boring operations and can also be set up for routing and spindle-sanding operations?
   1. Band Saw
   2. Scroll Saw
   3. Drill Press
   4. Disc/Belt Sander
8. When using the band saw, the upper blade-guide should be positioned \_\_\_\_\_\_ inch above the workpiece.
   1. 1/16”
   2. 1/8”
   3. 1/4"
   4. 1/2"
9. When using the disc/belt sander, the table should be positioned no more than \_\_\_\_\_\_\_\_\_ from the sanding surface?
   1. 1/16”
   2. 1/8”
   3. 3/16”
   4. 1/4"
10. When using the scroll saw, the hold-down foot/blade guard should be positioned:
    1. Just touching the work
    2. 1/16” above the work
    3. Tightly against the work
    4. 1/8” above the work

**Measuring**

1. Measure the following line to the nearest 1/16” and write the measurement here: \_\_\_\_\_\_\_\_\_\_
2. Measure the following line to the nearest 1/16” and write the measurement here: \_\_\_\_\_\_\_\_\_\_
3. Measure the following line to the nearest 1/16” and write the measurement here: \_\_\_\_\_\_\_\_\_\_
4. What is half of 13 ¼”?
5. What is two times 7 ¾”?

**The Engineering Design Process**

1. List, in order, the 5 steps of the engineering Design Process as discussed in class (3 pts).
2. Which step of the design process involves narrowing down a list of ideas to one idea that you think is the most viable solution?
   1. Identify/Define the Problem
   2. Brainstorm Solutions
   3. Test the Prototype
   4. Redesign/Optimize
3. Which step of the design process involves determining whether the prototype solution met the criteria and constraints for the design problem?
   1. Brainstorm Solutions
   2. Create a Prototype
   3. Test the Prototype
   4. Redesign/Optimize
4. Which step of the design process involves identifying criteria and constraints and investigating existing solutions?
   1. Identify/Define the Problem
   2. Create a Prototype
   3. Test the Prototype
   4. Redesign/Optimize
5. Which step of the design process involves the creation of models and a working version of the solution?
   1. Identify/Define the Problem
   2. Brainstorm Solutions
   3. Create a Prototype
   4. Test the Prototype
6. Which step of the design process involves reapplying the design process to improve the solution?
   1. Brainstorm Solutions
   2. Create a Prototype
   3. Test the Prototype
   4. Redesign/Optimize
7. Which of the following types of problems are best solved using the Engineering Design Process?
   1. Ethical/Moral problems
   2. Aesthetic problems
   3. Scientific problems
   4. Technological problems

**The Design Notebook**

1. **True or False** (circle one): The design notebook should contain plenty of empty space.
2. **True or False** (circle one): It is appropriate for all team members present to sign and date each entry in the design notebook.
3. **True or False** (circle one): It is acceptable to paste or tape outside materials into the design notebook when necessary.
4. **True or False** (circle one): The design notebook only needs to contain sketches and a brief description of the project.
5. **True or False** (circle one): If you number the pages in your design notebook, you don’t need a Table of Contents
6. **True or False** (circle one): Each step of the design process, in addition to daily log entries, should be clearly labeled.
7. **True or False** (circle one): Empty space can be dealt with by simply writing “Unused” in the middle of it.
8. Which of the following are reasons to document the design process?
   1. Identify problems and assist with troubleshooting
   2. Communicate/coordinate among design team members
   3. Provide evidence of work
   4. All of the above
9. Which of the following is the best choice for a design notebook?
   1. Loose-leaf binder with college-ruled note paper
   2. A college-ruled, spiral-bound notebook
   3. A graph ruled composition book
   4. Some loose paper in your project locker.

**Structures**

1. A structural member that supports loads vertically in compression is called a(n):
   1. Tension member
   2. Column
   3. Beam
   4. Arch
2. A non-flexible, semi-circular structural member which supports loads in compression by transmitting the load to either end of the member is called a(n):
   1. Cable system
   2. Column
   3. Beam
   4. Arch
3. A structural member which supports loads in tension and can change shape significantly based on where the load is located is called a:
   1. Cable system
   2. Truss
   3. Beam
   4. Column
4. A structural member that combines many tension and compression members in a system of triangles to support a load is called a(n)
   1. Tension member
   2. Beam
   3. Truss
   4. Arch
5. A structural member that supports loads in tension, often by suspending them from above, is called a(n):
   1. Tension member
   2. Cable-system
   3. Column
   4. Arch
6. A one-piece structural member that supports loads in flexion (compression and tension combined) is called a(n):
   1. Tension member
   2. Column
   3. Cable-system
   4. Beam
7. A force in engineering mechanics is best described as:
   1. A mystical energy field that binds all living things in the universe
   2. A push or a pull
   3. Tension or compression
   4. The tendency to rotate about a point
8. A dead load is best characterized as:
   1. A permanent, unchanging load on a structure such as its own weight
   2. A load that is temporarily applied, such as snow on a roof
   3. A load that is caused by inanimate objects
   4. A load that doesn’t cause a change in shape of the structure.
9. A live load is best characterized as:
   1. A permanent, unchanging load on a structure such as its own weight
   2. A load that is temporarily applied, such as snow on a roof
   3. A load that is caused by living things
   4. A load that causes a change in shape of the structure.