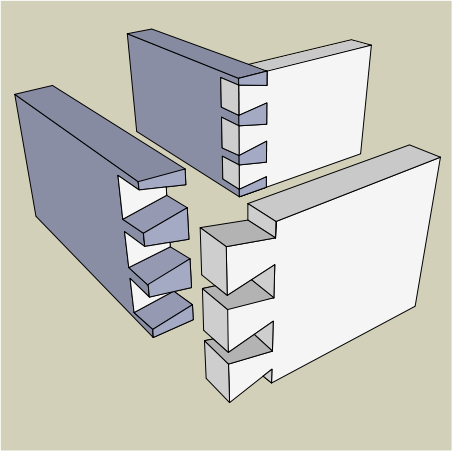
**2013 State Agricultural Mechanics Written Examination**

**Directions: Place your name, chapter, and contestant number on the accompanying scantron form that you will receive from the test administrators. Read each of the following multiple-choice items and the possible answers carefully. Mark the letter of the correct answer on your answer sheet (scantron form) as instructed by the test administrators. PLEASE MAKE NO MARKS ON THIS TEST.**

1. Which safety color is used to identify areas or items of danger or emergency such as safety switches and fire equipment?
   1. Blue
   2. Green
   3. Orange
   4. Red
2. Which refers to the direction of flow of electricity in the welding circuit?
   1. Ampere
   2. Polarity
   3. Volt
   4. Watt
3. Which soil is **MOST** likely to have problems from fertilizers and pesticides leaching into the groundwater?
   1. Clayey surface and clayey subsurface
   2. Loamy surface and loamy subsurface
   3. Pure silt in the surface and subsurface
   4. Sandy surface and sandy subsurface
4. Which uses a tungsten electrode to begin an electric arc that creates a temperature of about 43,000°F in a small, very concentrated area?
   1. DC Reverse polarity
   2. MIG
   3. Plasma arc
   4. TIG
5. When one cuts a “v” in the surface of wood to receive flathead wood screw, the procedure is known as:
   1. Anchoring.
   2. Annealing.
   3. Countersinking.
   4. Planing.
6. By hanging fire extinguishers on walls within easy reach where fire is likely to occur, one ensures:
   1. Extinguishers will not be tampered with when not in use.
   2. Fires will always be extinguished.
   3. Shop workers will know how to operate the extinguisher.
   4. The extinguisher will be available if it is needed.
7. As the diameter of a motor pulley turning at a given rpm is increased, the speed of the driven machine:
   1. Decreases proportionally.
   2. Increases proportionally.
   3. Remains the same.
   4. Stops**.**
8. If a commode flush valve fails to seat properly, the **MOST** likely result is the commode:
   1. Cuts off automatically.
   2. Does not cut off.
   3. Flush tank overflows.
   4. Toilet bowl overflows.
9. Which land capability class is **MOST** likely to need tile drainage?
   1. I
   2. IIIe
   3. IIIs
   4. IIIw
10. A weld placed in a joint created by a 90 degree angle is a/an:
    1. Butt weld.
    2. Fillet weld.
    3. Spot weld.
    4. Tack weld.

1. When power uses fluids to transfer force, it is called:
   1. Air pressure.
   2. Hydraulics.
   3. Hydroponics.
   4. Steam.
2. Which wood joint is illustrated by the picture below?

[](http://upload.wikimedia.org/wikipedia/commons/6/6a/Joinery-throughdovetail.svg)

* 1. Butt
  2. Dado
  3. Dovetail
  4. Rabbit

1. When a piece of wood is being ripped 3" or less wide on the table saw, the operator should ensure safe operation by:
   1. Increasing the speed that the wood is pushed through the saw.
   2. Removing the splitter.
   3. Using the miter gage.
   4. Using a push stick.
2. Which material is relatively inexpensive, water- and moisture-resistant, holds screws and nails very well and has become the standard material for roof decking?
   1. Hardy plank
   2. OSB (oriented strand board)
   3. Plywood with AD rating
   4. Vinyl sheathing
3. A strip of perennial vegetation next to a stream or river is **MOST** important in:
   1. Buffering the water from surface water contamination.
   2. Giving livestock a good source of forage.
   3. Keeping wildlife away from the water.
   4. Providing raptors a habitat for nesting.
4. A popular, easy to use electrode for beginners that is recommended for thinner metal because of its shallow penetration is the:
   1. E6011.
   2. E6013.
   3. E7015.
   4. E7028.
5. Which electrode would have the highest tensile strength and greatest depth of penetration?
   1. E6010
   2. E6011
   3. E6013
   4. E7028
6. Which form of energy has recently received government subsidy to increase its use?
   1. Coal
   2. Natural gas
   3. Oil
   4. Solar

1. Which is the timber that carries the weight of a building’s floors and interior walls?
   1. Girder
   2. Purlin
   3. Rafter
   4. Stud
2. Which tillage system places the crop seed directly into the residue of the remaining crop without disturbing the soil by plowing?
   1. Chiseling
   2. Conventional
   3. Disking
   4. No till
3. What is the **BEST** way to repair a *mushroomed* punch?
   1. Coat it with used motor oil
   2. Drill a hole through the crown of the punch
   3. Paint it with rust resistant paint
   4. Reshape the bevel around the crown by grinding
4. An SMV emblem is a safety emblem required on all:
   1. Electric arc welders to remind people to use welding helmets.
   2. Service entrance panels when electrical repairs are being conducted.
   3. Table saws that have 12" blade capacity.
   4. Vehicles that travel a maximum of 25 miles per hour.
5. In the four-cycle engine, during which stroke is fumes pushed out of the cylinder?
   1. Compression
   2. Exhaust
   3. Intake
   4. Power
6. Electrical resistance increases as the length of the conductor increases and results in a proportionate amount of:
   1. Amperage decrease.
   2. Amperage increase.
   3. Voltage drop.
   4. Voltage increase.
7. How many gallons of irrigation water are required to provide an acre-inch of water to the soil?
   1. 5,000
   2. 13,000
   3. 27,000
   4. 51,000
8. Which saw is very versatile and operates much like a drill with the cutting action at the end of the tool rather than underneath?
   1. Band saw
   2. Hack saw
   3. Table saw
   4. Tiger saw
9. If one desires a very smooth finish when planning a board, the **LAST** pass through the planer should dress **ONLY** how much from the lumber?
   1. 1/16"
   2. 1/8"
   3. 3/16"
   4. 1/4"
10. What is the advantage of a double-action cylinder in a hydraulic system that can apply pressure in either direction?
    1. It allows twice as much fluid to flow in the system
    2. It can exert pressure by pulling or pushing
    3. Less hydraulic fluid is required to operate the cylinder
    4. The need for filters and check valves is eliminated
11. If one wants to obtain a smooth finish on concrete, the **BEST** technique is to:
    1. Keep the concrete surface moist by using a sprinkler during curing.
    2. Pull a coarse bristled broom across the setting concrete.
    3. Trowel the concrete after it starts to harden.
    4. Wash away some of the cement paste to leave the aggregate exposed.
12. The drip irrigation system uses emitters in the system to:
    1. Filter the water in the system.
    2. Hold the water tubing in the bottom of each furrow.
    3. Increase the water pressure at several points in the system.
    4. Release the water slowly at the point of irrigation.
13. Which is the **BEST** tool for use to transfer an angle from a board that has been cut to another board so the same angle can be cut on the second board?
    1. Framing square
    2. Sliding T bevel
    3. Speed square
    4. T square
14. The components necessary for any fire to burn are oxygen, fuel, and:
    1. Heat.
    2. Liquids.
    3. Solids.
    4. Water.
15. Which small engine system needs the **MOST** maintenance?
    1. Cooling
    2. Compression
    3. Fuel
    4. Ignition
16. What is the **MAJOR** advantage of trusses?
    1. Can span areas over 100' for roofs without post
    2. Eliminate the need for plywood sheathing
    3. Provide more support for exterior walls
    4. Replaces the need for girders in large floor systems
17. What system is used to handle human waste in rural areas and outside of towns and cities?
    1. Chlorination
    2. Lagoon
    3. Septic tank
    4. Treatment plant
18. Which is true of the white wire attached to a light switch?
    1. Does not have electricity flowing through it
    2. Grounds the switch to the box
    3. Serves as a hot wire
    4. Serves as a neutral wire

1. Class C fires must be put out with carbon dioxide gas or dry chemicals extinguishers because they involve:
   1. Burning water.
   2. Large amounts of paper.
   3. Pressure treated lumber.
   4. The presence of electricity.
2. Wires are connected together in electrical boxes by:
   1. Elastic bands.
   2. Metal clamps.
   3. Plastic ties.
   4. Wire nuts.
3. What is the purpose for actuators in electric motors?
   1. Increase the voltage from the line to the motor
   2. Keep the electric motor lubricated
   3. Place another device in motion
   4. Protect against electrical shock
4. Which pipematerial is lightweight and **BEST** for sewage lines where large diameters are required?
   1. ABS
   2. Cast iron
   3. Chlorinated polyvinyl chloride
   4. PEX
5. When cutting mild steel with an oxyacetylene torch, the inner cone should be maintained:
   1. In contact with the metal being cut.
   2. 1/8 inch from the metal being cut.
   3. 1/2 inch from the metal being cut.
   4. 3/4 inch from the metal being cut.
6. Which system uses a pump, water, and a burner to clean metal equipment and engines?
   1. Power washer
   2. Sandblaster
   3. Steam cleaner
   4. Wire brush
7. How often should air filters on small gasoline engines be cleaned under normal conditions?
   1. After every 5 hours of operation
   2. After every 25 hours of operation
   3. Once every 100 hours of operation
   4. Only when the motor fails to run
8. When one is screeding concrete, they are:
   1. Adding wire mesh to give the concrete support.
   2. Pulling a coarse bristled broom across the setting concrete.
   3. Removing excess concrete to create a smooth level surface.
   4. Smoothing the setting concrete with a metal trowel.

1. What is the pipe fitting displayed in both pictures below?

 [](http://www.thefind.com/buy-CG1pPGH?result_view_id=6990194b16aaa21423e4665534cd1d62:0001&result_impression_id=6990194b16aaa21423e4665534cd1d62:0002)

* 1. Coupling
  2. 45° Pipe elbow
  3. 90° Pipe elbow
  4. Union

1. Which tool is used to cut threads onto a rod or bolt?
   1. Countersink
   2. Die
   3. Tap
   4. T bevel
2. A list and description of all the materials to be used in constructing a project is a:
   1. Bill of materials.
   2. Contract.
   3. Lien.
   4. Pictorial drawing.
3. How can one cheaply ensure that concrete will not stick to the wooden forms?
   1. Coat the forms with used motor oil
   2. Shovel soil on the outside of the forms
   3. Spray the forms with water
   4. Use pressure treated lumber

1. Which is an advantage of spiral-shank nails?
   1. Can be used with a cordless drill
   2. Cost less than other nails
   3. Eliminates the need for staples
   4. Have more holding power

1. Which screw design provides for a sure fit between the driver and the screw to minimize slippage?
   1. Flat
   2. Oval
   3. Round
   4. Torx