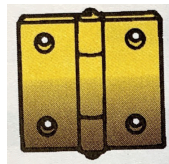


**North Carolina FFA Association**  
**2019 State Agricultural Mechanics Written Exam - KEY**

Directions: *Place your name, chapter and contestant number on the scantron form that you receive from the test administrators. Read each of the following multiple-choice items and possible answers carefully. Mark the letter of the correct answer on your scantron form. PLEASE DO NOT WRITE ON THIS TEST.*

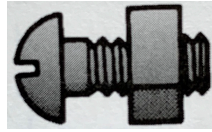
1. For how long can exposure to loud sounds without ear protection affect your hearing?
  - A. one hour
  - B. 24 to 48 hours
  - C. the rest of your life**
  - D. It will not affect your hearing.
2. How should gas cylinders be protected from being accidentally knocked over?
  - A. stood in a corner
  - B. leaned back in a portable cart
  - C. by wrapping the hoses around them and the post
  - D. with a chain around them connected to a wall or cart**
3. What is the primary job of a regulator?
  - A. to control the rate of flow
  - B. to serve as a safety device
  - C. to serve as a flashback arrestor
  - D. to reduce a high pressure to a lower pressure**
4. What out-of-position welding position is the most common?
  - A. flat
  - B. vertical**
  - C. overhead
  - D. horizontal
5. The \_\_\_\_\_ welding process is very flexible and the most commonly used welding process on farms and ranches.
  - A. OFW
  - B. RSW
  - C. GTAW
  - D. SMAW**
6. Oxygen hoses and related equipment are color coded
  - A. red
  - B. ivory
  - C. green**
  - D. orange

7. The fuel with the best qualities for welding and cutting is
- A. MAPP
  - B. propane
  - C. acetylene**
  - D. natural gas
8. When piercing metal, the clearance is increased after preheating to
- A. introduce more air into the process
  - B. reduce the hazard from molten metal**
  - C. increase the force of the oxygen stream
  - D. provide time for heat to move through the metal
9. The most popular brazing alloy is
- A. silver
  - B. tin-lead
  - C. aluminum
  - D. copper-zinc**
10. The most popular soldering alloy is
- A. silver
  - B. tin-lead**
  - C. aluminum
  - D. copper-zinc
11. The output of a welder is relatively:
- A. low voltage and low amperage
  - B. low voltage and high amperage**
  - C. high voltage and low amperage
  - D. high voltage and high amperage
12. The welding process that uses an automatic wire feed is
- A. stick
  - B. GTAW
  - C. GMAW**
  - D. oxyacetylene
13. Identify the type of hinge pictured here
- A. butt**
  - B. hasp
  - C. strap
  - D. cabinet



14. Identify the fastener pictured here

- A. plow bolt
- B. carriage bolt
- C. machine bolt
- D. round-head stove bolt**



15. Identify the tool pictured here

- A. cold chisel**
- B. drift punch
- C. wood chisel
- D. center punch



16. Identify the nail pictured here

- A. cut
- B. box
- C. finishing**
- D. plasterboard

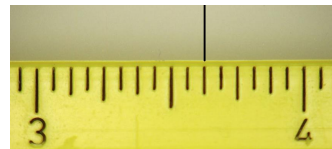


17. Of the following, the smallest unit of metric measurement is

- A. meter
- B. kilometer
- C. millimeter**
- D. centimeter

18. Identify the measurement noted by the line on the inch rule.

- A. 3 5/8"**
- B. 3 7/8"
- C. 3 9/16"
- D. 3 11/16"



19. Lumber is graded according to its

- A. cost and length
- B. color and species
- C. strength and durability
- D. appearance and soundness**

20. The groove cut across the end of a board to receive another board is called a

- A. dado**
- B. miter
- C. rabbet
- D. ratchet

21. The strongest nailing method is:
- A. clinching**
  - B. flat nailing
  - C. toe nailing
  - D. end nailing
22. The glue most commonly used with wood is \_\_\_\_\_.
- A. urea
  - B. epoxy
  - C. aliphatic resin**
  - D. contact cement
23. Choices of teeth per inch for hacksaw blades are
- A. 14, 24, and 36
  - B. 14, 18, 24, and 32**
  - C. 14, 20, 26, and 32
  - D. 14, 20, 26, and 36
24. The first tool to use in drilling a hole in metal is the
- A. file
  - B. drill
  - C. ream
  - D. center punch**
25. If you cannot get to both sides of sheet metal, the rivet to use is the
- A. pop rivet**
  - B. split rivet
  - C. solid steel rivet
  - D. copper rivet and burr
26. A variable-speed tool is one that will run
- A. in hot locations
  - B. at different speeds**
  - C. backward as well as forward
  - D. a long time without damage
27. Routers are used for
- A. making holes
  - B. setting screws
  - C. crosscutting boards
  - D. creating grooves and decorative edges**

28. When using a bandsaw, the operator should avoid
- A. sawing curved lines
  - B. backing out of cuts**
  - C. cutting metal
  - D. crosscutting
29. The most popular use of the radial arm saw is
- A. drilling
  - B. ripping
  - C. cutoff work**
  - D. curve cutting
30. The blade on a bandsaw can be checked for squareness with the table by using a
- A. caliper
  - B. try square
  - C. sliding T bevel
  - D. framing square**
31. A grinding wheel may fly apart when running if the wheel does not have
- A. a clean surface
  - B. a coarse texture
  - C. a coolant device
  - D. an adequate speed rating for the motor**
32. The compression ratio for most small engines is
- A. 6:1**
  - B. 7:2
  - C. 16:1
  - D. 50:1
33. When the engine is on the compression stroke
- A. the intake valve is open
  - B. both valves are closed**
  - C. only the exhaust valve is closed
  - D. the exhaust valve and the intake valve are open
34. The thick plate that covers the cylinder on a small engine is called a
- A. cap
  - B. seal
  - C. head**
  - D. valve

35. Oil should be changed when the engine is  
**A. warm**  
B. cool  
C. cold  
D. hot
36. The most difficult system to repair in a small engine is the  
A. fuel system  
B. ignition system  
C. lubrication system  
**D. compression system**
37. The compression ratio for a typical diesel engine is  
A. 6:1  
B. 8:1  
C. 16:1  
**D. 18:1**
38. In diesel engines, water combined with fuel can cause enough corrosion to ruin the  
A. radiator  
B. water pump  
**C. injector pump**  
D. filtering system
39. A device used to protect electrical circuits that be reset is a  
A. fuse  
**B. circuit breaker**  
C. three-way switch  
D. ground-fault interrupter
40. Electricity is distributed to branch circuits by  
A. a service drop  
B. an electric meter  
C. an entrance head  
**D. a service entrance panel**
41. A properly wired circuit will be  
A. open  
B. shorted  
**C. grounded**  
D. a common terminal

42. In three-way switch circuits, electricity passes from one switch to the other through
- A. neutral wires
  - B. traveler wires**
  - C. common terminals
  - D. grounding screws and wires
43. The easiest water or sewer system to install uses pipe made of
- A. steel
  - B. plastic**
  - C. copper
  - D. cast iron
44. The irrigation system that adds water by flooding furrows is
- A. trickle
  - B. surface**
  - C. sprinkler
  - D. subirrigation
45. Emitters are used to
- A. water the tops of plants
  - B. flood the furrows with water
  - C. release water slowly into the soil**
  - D. release water rapidly into the soil
46. Courses of block are laid in a straight line by using a
- A. line**
  - B. plumb bob
  - C. center punch
  - D. sighting tool
47. Forms for concrete slabs are usually made of
- A. 2" X 4"**
  - B. 2" X 8"
  - C. 2" X 10"
  - D. 2" X 12"
48. A standard-sized block when laid will cover an area
- A. 4" high by 12" long
  - B. 4" high by 16" long
  - C. 8" high by 12" long
  - D. 8" high by 16" long**

49. The volume of a gas is inversely proportional to its

- A. area
- B. weight
- C. pressure**
- D. temperature

50. Force acting on an area is

- A. pressure**
- B. horsepower
- C. compression
- D. measured in kilograms