

FFA
STATE FINALS
AGRICULTURAL MECHANICS WRITTEN EXAM

Instructions:

1. Remain in your seat at all times until excused by the exam instructor.
 2. DO NOT mark on this examination sheet. Mark the SCANTRON only.
 3. Use #2 pencil only.
 4. Place your contestant name where instructed, on the SCANTRON only.
 5. When marking your answers, completely fill in the correct answer box.
 6. There is only one best answer for each question.
 7. The exam monitor will not answer questions during the exam.
 8. This is a **CLOSED BOOK/NOTES EXAM!! NO NOTES OF ANY FORM ARE ALLOWED.**
 9. Calculators are provided if you don't have one.
 10. When you have finished the exam, turn your paper over and remain in your seat. The exam monitor will collect all the papers and answer sheets at the end of the time period. You will then be excused.
- GOOD LUCK!!**

USE WRITTEN EXAM B (1-50)

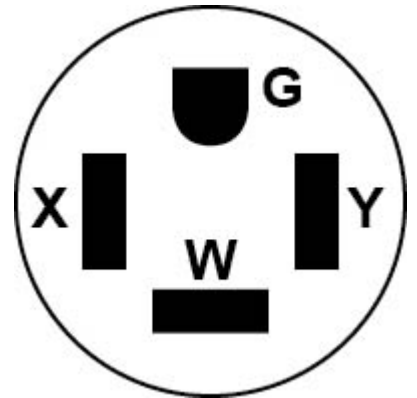
1. A welder has a duty cycle rating of 60%. Generally, this means that this machine can:
 - a. Weld for 60 minutes without stopping at its rated output
 - b. Weld for 6 minutes during a 10-minute time frame at its rated amperage
 - c. Only produces 60% of its rated output
 - d. Uses 60-hertz cycle electricity
2. Alternating current reverses its direction of flow frequently. In the United States, how many times does the electricity reverse its direction per second?
 - a. 2
 - b. 4
 - c. 50
 - d. 60
 - e. 80
3. In SMAW a beginner should lean the electrode _____ degrees from vertical in the direction of travel
 - a. 75-80
 - b. 5-10
 - c. 80-90
 - d. 10-15
 - e. None of the above
4. The arc from a welder has a temperature of about 9,000 degrees Fahrenheit. The exact temperature varies with the length of the arc, amperage setting, and cable diameter.
 - a. True
 - b. False
5. A properly prepared butt joint should have metal ground down to leave a root thickness that is no greater than _____.
 - a. $\frac{1}{8}$ "
 - b. The diameter of the electrode core
 - c. The width of the weld bead
 - d. The length of the electrode
 - e. None of the above
6. When color-coding items to safety standards, which color is used for signs to designate warning or caution?
 - a. Red
 - b. Orange
 - c. Yellow
 - d. Black/yellow
 - e. Blue
7. When a drawing is labeled $\frac{1}{4}" = 1'$, what does this mean?
 - a. Each foot of the actual object is represented by $\frac{1}{4}"$
 - b. The drawing is reduced by $\frac{1}{4}$ of its actual size
 - c. $\frac{1}{4}$ foot on the drawing represents 1 foot in real life
 - d. Every four inches on the drawing represents 1 foot in real life
 - e. None of the above

8. The national organization(s) that helped to develop safety color coding is/are the
- a. American Society of Agricultural Engineers
 - b. American Vocational Association
 - c. National Safety Council
 - d. All of the above
 - e. Both A and C

9. When fighting fires, carbon dioxide (CO₂) gas can be used with
- a. Class A fires
 - b. Class B fires
 - c. Class C fires
 - d. Both B and C
 - e. All of the above

10. According to OSHA, what is the maximum safe limit of decibels for a 2-hour period is ____
- a. 110 dB
 - b. 100 dB
 - c. 90 dB
 - d. 50 dB
 - e. 40 dB

11. Using the picture to the right, what wire should be connected to the X?
- a. Black
 - b. White
 - c. Green
 - d. Red
 - e. Either Black or Red



12. The service entrance panel is a box with fuses or circuit breakers where electricity enters a building.
- a. True
 - b. False

13. What type of electrical conductor can be used for underground branch circuits?
- a. SE
 - b. SER
 - c. SEUF
 - d. UF
 - e. NM

14. How does a Ground Fault Circuit Interrupter (GFCI) protect the user from electrical shock?
- a. By limiting the total voltage supplied to a circuit
 - b. By increasing resistance in the circuit when moisture is present
 - c. By shutting off power when a load imbalance occurs between the hot and neutral wires
 - d. By grounding excess electricity directly into the earth at all times

15. When drilling holes for routing electrical circuits, the hole must not be less than _____ from the edge of a standard 2x4 wood stud.
- $\frac{5}{8}$ "
 - $\frac{3}{4}$ "
 - 1"
 - 1 $\frac{1}{4}$ "
 - All of the following
16. A variable resistor used to control voltage is called a _____
- Rheostat
 - Thyristor
 - Potentiometer
 - Fixed resistor
 - None apply
17. _____ converts light energy into electrical energy.
- Photovoltaic cell
 - Photoconductive cell
 - Photodiode
 - Phototransistor
 - None apply
18. A generator produces alternating current
- True
 - False
19. The formula for calculating horsepower is $W \text{ (lb)} \times D \text{ (ft)} \times T \text{ (sec)}$ divided by
- 50
 - 55
 - 500
 - 550
 - None of the above
20. One type of direct motor drive is
- Belt and pulleys
 - Differential
 - Flexible shaft
 - Transmission
 - None of the above
21. A _____ is used to reestablish the height of an instrument after it has been moved.
- True Foresight
 - Backsight
 - Benchmark
 - Turning Point
 - None apply

22. How many miles are there between standard parallels?
- 12
 - 16
 - 20
 - 48
 - None of the above
23. Geodetic surveying assumes the earth is flat and that all rod readings are measurements from a flat surface
- True
 - False
24. When checking for errors in differential leveling the process of surveying back to the starting point is referred to as _____
- Closing the loop
 - Note check
 - Allowable error for closure
 - Benchmark reset
 - None of the above
25. Capable of measuring both horizontal and vertical angles with a high degree of precision.
- Laser levels
 - Automatic level
 - Transits
 - Dumpy level
 - None of the above
26. The two broad classifications of wood are softwood and hardwood. They are classified based on
- Whether the tree sheds its leaves in winter
 - The density of the wood grain
 - How close the rings are
 - How well the wood resists indentation
 - Both B and D
27. Green lumber may have as much as _____ moisture content
- 8-15%
 - 30-50%
 - 50-75%
 - 120-130%
 - None of the above
28. Which one below is NOT a clear finish used on wood?
- Oil
 - Polyurethane
 - Lacquer
 - Shellac
 - None of the above

29. The thin, oval-shaped pieces of wood that are fitted and glued into slots cut on the edge of a board being joined are called
- Dowels
 - Biscuits
 - Dovetails
 - Pocket holes
 - None of the above
30. Which power tool is designed for sawing curves, but is a poor tool for straight cutting
- Scroll saw
 - Band saw
 - Hand saw
 - Coping saw
 - None of the above
31. Steel pipe is frequently preferred to copper for a water line because
- Resists corrosion
 - Easy to handle
 - It has been known to withstand freezing temperatures without breaking
 - Can be bent around objects
 - None of the above
32. A common problem with faucets and valves is a hammering noise when water is running slowly, which can be cause/fixed by
- Tightening the packing nut
 - Poor water pressure
 - Replacing the coupling nut
 - Both A and B
 - None of the above
33. Which plastic pipe is approved by some plumbing codes for hot water
- PVC
 - CVPC
 - Steel Pipe
 - Both A and B
 - None of the above
34. Type K copper pipe has a life expectancy of _____ when underground in most conditions
- 10years
 - 14-20 years
 - 30-80 years
 - 40-100 years
 - None of the above
35. When reddish-colored water comes from a faucet, it generally means that there is a reaction between the water and the steel pipe.
- True
 - False

36. The cutting lip of high-speed twist drill should have a _____ degree angle
- 12
 - 59
 - 90
 - 118
 - None of the above
37. Steel up to ½” thick can be punched with hand tools if the metal is red hot
- True
 - False
38. When using a hacksaw, the number of teeth cutting at one time should be
- Two
 - Three
 - Four
 - Five
 - None of the above
39. The hardy hole on an anvil is designed to hold an anvil chisel, which allows the user to
- Punch holes in metal
 - Bend metal
 - Twist metal
 - Round metal
 - Cut metal
40. Diamond point chisels are designed to cut grooves.
- True
 - False
41. Which gas(es) are used in oxy-fuel cutting?
- Acetylene
 - Propane
 - MAPP gas
 - All of the above
 - Both A and C
42. Oxy-fuel cutting can easily cut
- Aluminum
 - Copper
 - Stainless steel
 - All of the above
 - None of the above
43. The ideal torch angle when oxy-fuel welding is
- 20 degrees
 - 45 degrees
 - 75 degrees
 - 90 degrees

44. Oxy-fuel hoses are reinforced with nylon or other material to withstand high pressures and heavy use
- True
 - False
45. When bonding with metals and alloys that melt at temperatures below 804°F, you are:
- Soldering
 - Brazing
 - Braze welding
 - Fusion welding
 - None of the above
46. Concrete is often covered in plastic as it cures to prevent
- Moisture from escaping
 - To protect the concrete from physical damage during curing
 - To increase the curing temperature
 - All of the above
 - Both A and C
47. To prevent forms from sticking to the concrete, they are treated with
- Fat
 - Motor oil
 - Paint
 - Wax
 - None of the above
48. _____ carries the weight over doors and window openings
- Sill
 - Lintel
 - Footer
 - Header
 - None of the above
49. Which of the following indicates that sand is NOT suitable for use in concrete based on the silt layer thickness after settling?
- The silt layer is less than 1/16" thick
 - The silt layer is exactly 1/8" thick
 - The silt layer is more than 1/8" thick
 - The silt layer is not visible
 - None of the above
50. Which is NOT an advantage of concrete
- Fireproof
 - Attractive
 - Available locally
 - Sanitary
 - None of the above