

**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!!**

1. Arc welding is popular in agricultural mechanics because agricultural students and workers can become good arc welders quickly.
 - a. True
 - b. False
 - c. Not enough information

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

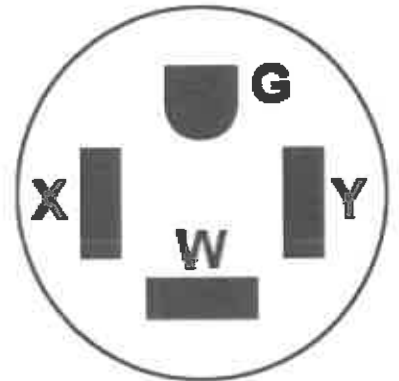
4. On a welding electrode color markings that are the flux near the exposed rod are called _____
 - a. End marking
 - b. Group marking
 - c. Spot marking
 - d. Color-coding is not used on welding electrodes

5. A 7014-welding electrode can be used for welding.
 - a. flat
 - b. vertical
 - c. overhead
 - d. horizontal
 - e. all apply

6. When color-coding items to safety standards, which color is used to designate machine hazards (such as edges and openings)?
 - a. Red
 - b. Orange
 - c. Yellow
 - d. Black/yellow
 - e. Blue

7. Large open spaces are needed in agricultural mechanics shops as compared with other shops for
 - a. Proper clean up procedures
 - b. Storing materials for the school custodians
 - c. Meeting fire code regulations
 - d. Project construction and machinery repair
 - e. All of the above

8. What does OSHA stand for?
- Occupational Service and Health Association
 - Occupational Service and Health Administration
 - Organizational Safety and Health Administration
 - Occupational Safety and Health Association
 - Occupational Safety and Health Administration
9. When fighting fires carbon dioxide (CO₂) gas can be used with
- Class A fires
 - Class B fires
 - Class C fires
 - Both B and C
 - All of the above
10. According to OSHA, what is the maximum safe limit of decibels for an 8-hour period is
- 110 dB
 - 100 dB
 - 90 dB
 - 50 dB
 - 40 dB



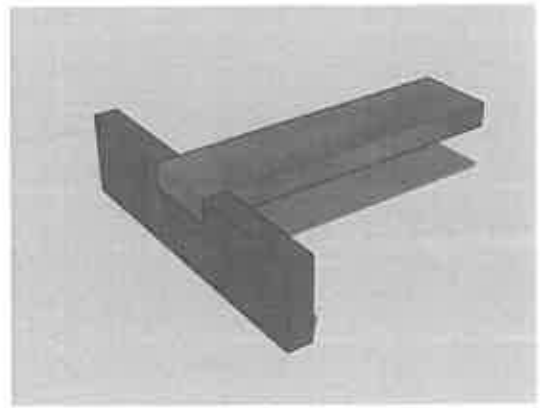
11. Using the picture to the right, what wire should be connected to the X?
- Black
 - White
 - Green
 - Red
 - Either Black or Red
12. Cable running across or along _____ must be secured to the framework every 4 ½' for the full length of the circuit run.
- Studs
 - Joists
 - Rafters
 - All of the above
 - None of the above
13. What type of electrical conductor can be used for underground service entrance use?
- SE
 - SER
 - SEUF
 - UF
 - USE
14. What is required in a circuit to control a light fixture with 4 switches?
- Four 4-way switches
 - Three 3-way switches and one 4-way switch
 - Two 3-way switches and two 4-way switches
 - Four 3-way switches
 - Not possible

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 _____ is a semiconductor device used for electronically controlled switches.
- Transistor
 - Thyristor
 - Diode
 - Integrated circuit
 - None apply
17. _____ converts light energy into electrical energy.
- Photovoltaic cell
 - Photoconductive cell
 - Photodiode
 - Phototransistor
 - None apply
18. A strong magnet can be made by wrapping many coils of insulated wire around a(n)
- Aluminum
 - Iron core
 - Copper
 - Stainless Steel
 - None of the above
19. An advantage of using solid state devices for motor control is:
- They have no moving parts
 - They are compact in design
 - They are more reliable than traditional controls
 - All of the above
 - 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 rod reading on a point that will not be used as a turning point:
- True Foresight
 - Backsight
 - Benchmark
 - Temporary Benchmark
 - None apply

22. Of the land descriptions given, which one is the most correct?
- SW1/2, NW1/4, S37, R5N, T5W
 - SW1/2, NW1/4, S33, R5W, T5N
 - SW1/4, NW1/2, S33, T5N, R5W
 - SW1/4, NW1/2, S37, T5W, R5N
23. Geodetic surveying assumes the earth is flat and that all rod readings are measured from a flat surface
- True
 - False
24. _____ is one of the most accurate methods for measuring distances, but is a slow process
- Chaining
 - Pacing
 - Odometer wheel
 - Stadia
 - None apply
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. Slash sawn wood is also known as:
- Quarter sawn
 - Rift sawn
 - Plain sawn
 - Live sawn
 - None apply
28. Which one below is NOT a clear finish used on wood?
- Oil
 - Polyurethane
 - Lacquer
 - Shellac
 - None of the above

29. What is the correct name for the following wood joint?

- a. Dado
- b. Rabbet
- c. Miter
- d. Lap
- e. None of the above



30. The smallest type of nail gun is

- a. Finish Nailer
- b. Brad Nailer
- c. Framing Nailer
- d. Corrugated Nailer
- e. None apply

31. Steel pipe is frequently preferred to copper for water line because

- a. Resists corrosion
- b. Easy to handle
- c. It has been known to withstand freezing temperatures without breaking
- d. Can be bent around objects
- e. None of the above

32. Steel pipe that is classified as standard pipe is generally used for construction rather than plumbing

- a. True
- b. False
- c. Not enough information given

33. Acrylonitrile-butadiene-styrene has largely replaced

- a. Cast-iron pipe
- b. Polyethylene pipe
- c. Polyvinyl chloride pipe
- d. Chlorinated polyvinyl chloride pipe
- e. None of the above

34. A common problem with toilet tanks and automatic livestock waterers is

- a. Green stain
- b. Dripping
- c. Incomplete shutoff
- d. All of these

35. When a reddish color water comes from a facet it generally means that there is a reaction between the water and copper pipe.

- a. True
- b. False

36. The tip of a solder iron is typically made from
- Iron
 - Stainless steel
 - Mild Steel
 - Copper
 - None of the above
37. Which of the three taps below is easiest to **finish** cutting threads?
- Plug
 - Taper
 - Bottoming
 - None apply
38. Copper rivets and burr are designed to fasten
- Leather products
 - Steel
 - Sheet metal
 - All of the above
39. The hardy hole in 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. When using a cutting torch, how do you properly confirm that a neutral flame has been achieved?
- Adjust the oxygen and fuel until the flame is quiet, then begin cutting
 - Open the fuel and oxygen valves fully, light the torch, and start cutting
 - Set a neutral flame, press the oxygen lever, and readjust if necessary
 - Light the torch, adjust only the fuel until the flame is blue, then cut
 - None of the above
42. Oxy-fuel cutting can easily cut
- Aluminum
 - Copper
 - Stainless steel
 - All of the above
 - None of the above

43. The best distance between cone and puddle when fusion welding with oxy-fuel is
- a. $\frac{1}{2}$ "
 - b. $\frac{1}{4}$ "
 - c. $\frac{1}{8}$ "
 - d. $\frac{1}{32}$ "
44. The amount of material that is removed during an oxy-acetylene cut is referred to as _____.
- a. Slag
 - b. Kerf
 - c. Flux
 - d. All apply
45. When bonding with metals and alloys that melt at temperatures below 804°F you are:
- a. Soldering
 - b. Brazing
 - c. Braze welding
 - d. Fusion welding
 - e. None of the above
46. After spreading concrete, you use a 2"x 4" board back and forth across the forms. This process is called
- a. Floating
 - b. Screeding
 - c. Finishing
 - d. Edging
47. Which is NOT a type of joint finish used on block walls
- a. Concave joint
 - b. V-joint
 - c. Flush joint
 - d. Raked joint
 - e. None of the above
48. _____ carries the weight over doors and window openings
- a. Sill
 - b. Lintel
 - c. Footer
 - d. Header
 - e. None of the above
49. Cement paste is made by mixing Portland cement and
- a. Water
 - b. Sand
 - c. Stone aggregates
 - d. All of the above
50. Which is NOT an advantage of concrete
- a. Fireproof
 - b. Attractive
 - c. Available locally
 - d. Sanitary
 - e. None of the above