

**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!!

51. The following aluminum weld is:



- a. GTAW
 - b. SMAW
 - c. NEMA
 - d. GMAW
 - e. All of the above
52. In arc welding, a power source that can operate under load for 15 minutes during each hour is known to have:
- a. 30% duty cycle.
 - b. a constant duty cycle.
 - c. 15-minute duty cycle.
 - d. a 25% duty cycle.
 - e. none apply
53. What is the **power** rating for an electrical source that draws 50 amps @ 230 volts?
- a. 50 amps
 - b. 230 volts
 - c. 11.5 kilowatts
 - d. 1150 watts
 - e. All apply
54. The following SMAW joining the two pieces of steel was done with which electrode?



- a. 6010
- b. 6011
- c. 7018
- d. 7024
- e. 6010 Or 6011

55. A 7018 welding electrode can be used for welding.

- a. flat
- b. vertical
- c. overhead
- d. horizontal
- e. all apply

56. When color-coding items to safety standards, which color is used for labeling the location of safety equipment (such as first aid)?

- a. Red
- b. Green
- c. Yellow
- d. Black/yellow
- e. Blue

57. When color-coding items to safety standards, which color is used for general information?

- a. Red
- b. Orange
- c. Black/yellow
- d. White
- e. Blue

58. What does OSHA stand for?

- a. Occupational Service and Health Association
- b. Occupational Service and Health Administration
- c. Organizational Safety and Health Administration
- d. Occupational Safety and Health Association
- e. Occupational Safety and Health Administration

59. What does ANSI stand for?

- a. American National Standards Institute
- b. Association of National Services Institute
- c. Administration of National Standards Information
- d. Association of National Services Incorporated
- e. None apply

60. According to OSHA, what noise level is likely to cause hearing damage, when exposed to for significant periods of time?

- a. 5000 W
- b. 40 dB
- c. 90 dB
- d. 50 dB
- e. 40 dB

61. In an electrical calculation, the formula: $E = IR$ is known as:

- a. Calculation for power
- b. VOM's law
- c. Ohm's law
- d. Reluctance equation
- e. Capacitance equation

62. The wires running from the electrical power utility's transformer (like P.G. & E.) to the entrance head are known as the _____.

- a. service entrance
- b. SEP
- c. service drop
- d. power wires
- e. service power wires.

63. What type of electrical conductor can be buried directly in the soil?

- a. DB (direct burial)
- b. SW (submerged wire)
- c. SC (submerged conductor)
- d. UF (underground feeder)
- e. BF (bottom feeder)

64. What is required in a circuit to control a light fixture with 4 switches?

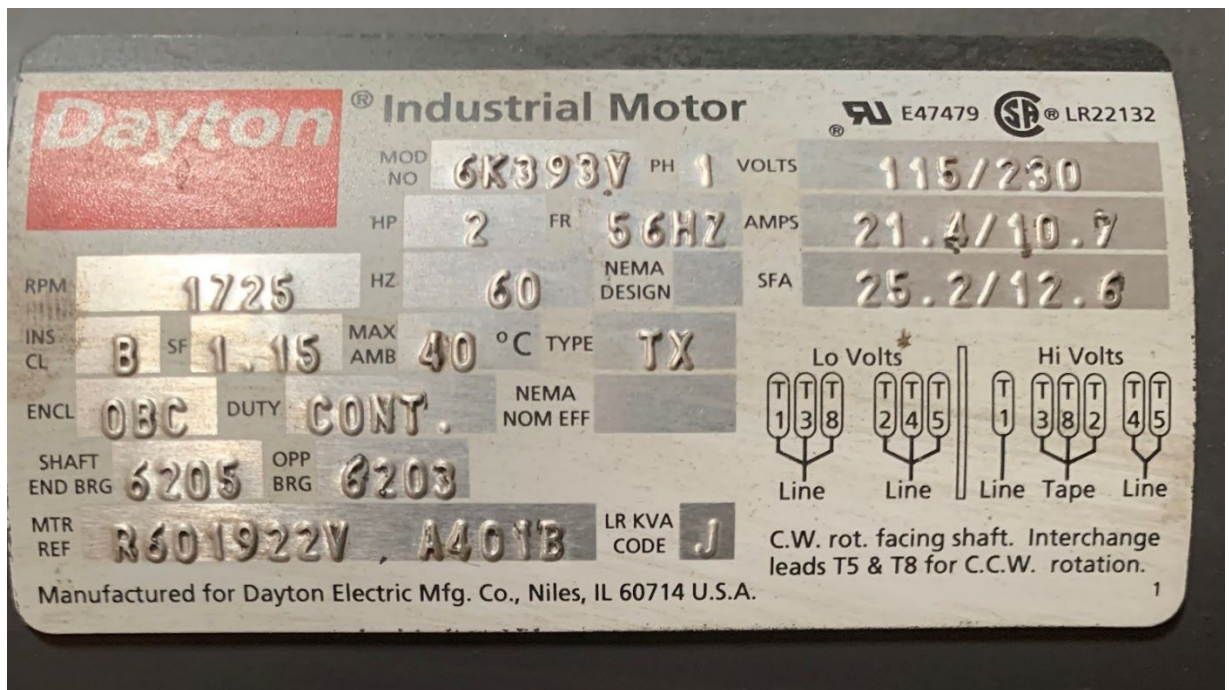
- a. Four 4-way switches
- b. Three 3-way switches and one 4-way switch

- c. Two 3-way switches and two 4-way switches
- d. Four 3-way switches
- e. Not possible

65. It is possible to safeguard several receptacles with one GFCI receptacle.

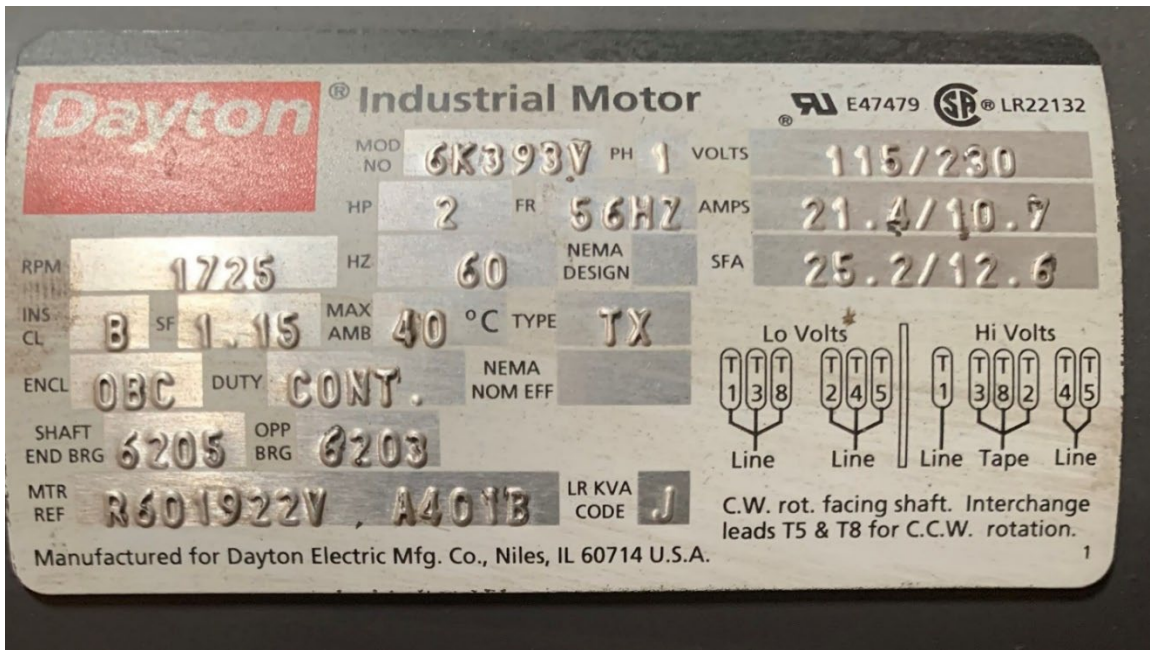
- a. True
- b. False
- c. Depends on the voltage level
- d. Depends on the current level
- e. All apply

66. Not including a safety ground wire, how many wires are required to run this motor?



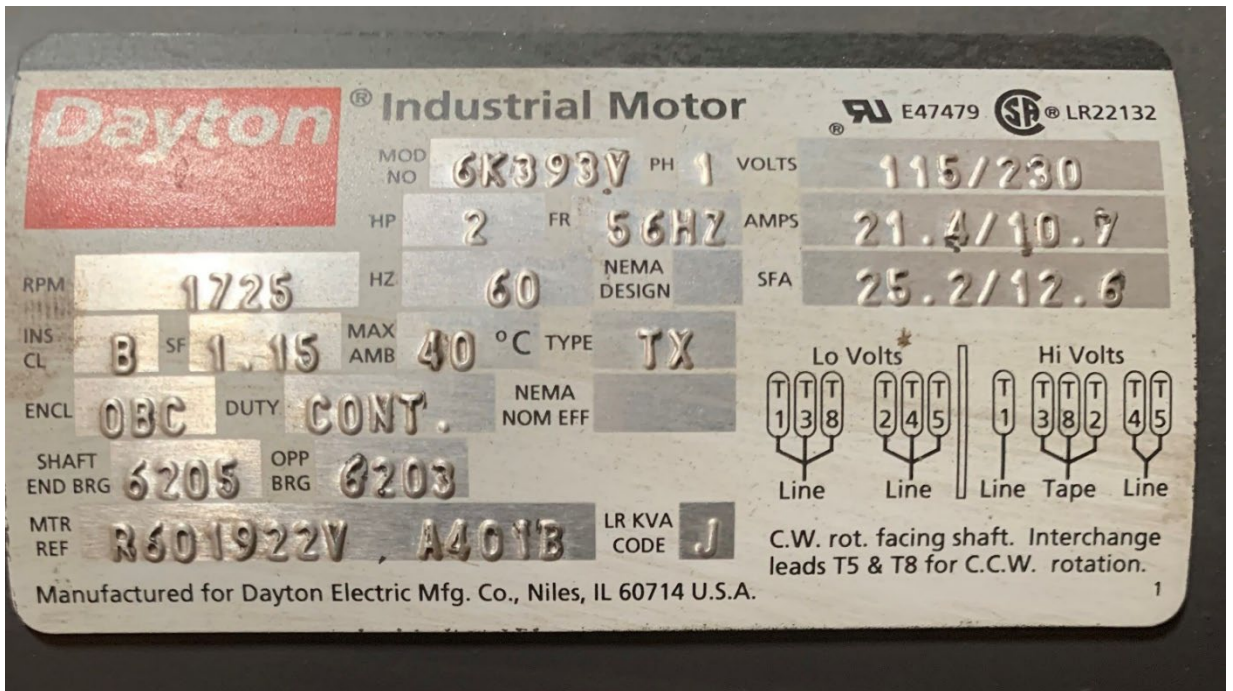
- a. 4
- b. 3
- c. 2
- d. 1
- e. None apply

67. What is the speed of this motor?



- a. 60 rpm
- b. 6203 rpm
- c. 1725 rpm
- d. 3500 rpm
- e. None apply

68. How much current will this motor require at 230 volts?



- a. 21.4 Amps
- b. 21.4 Volts
- c. 10.7 Volts

- d. 10.7 Amps
- e. 40 Amps

69. What is required to control a large, high current motor with a small, low current rated switch?

- a. Starting capacitor
- b. Rectifier
- c. Transformer
- d. Magnetic switch or relay
- e. Not possible.

70. An electric motor's bearings usually include:

- a. balls
- b. inner races
- c. outer races
- d. cages
- e. all apply

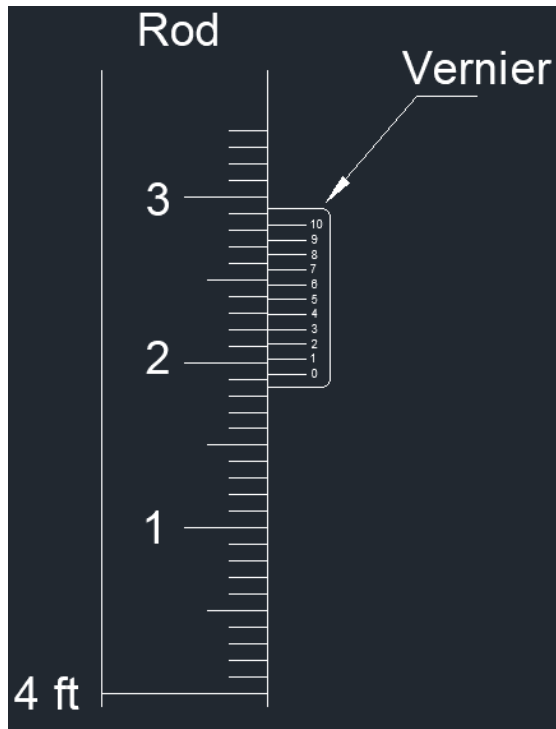
71. In surveying with an automatic level, "HI" stands for:

- a. Height of the instrument
- b. Surveyor's rod needs to be extended (higher)
- c. Height of the rod
- d. Height of the Bench Mark
- e. None apply

72. A temporary point whose elevation is determined during the process of leveling is known as:

- a. Temporary point
- b. Typical point
- c. Turning point
- d. Foresight
- e. None apply

73. The rod reading below is:

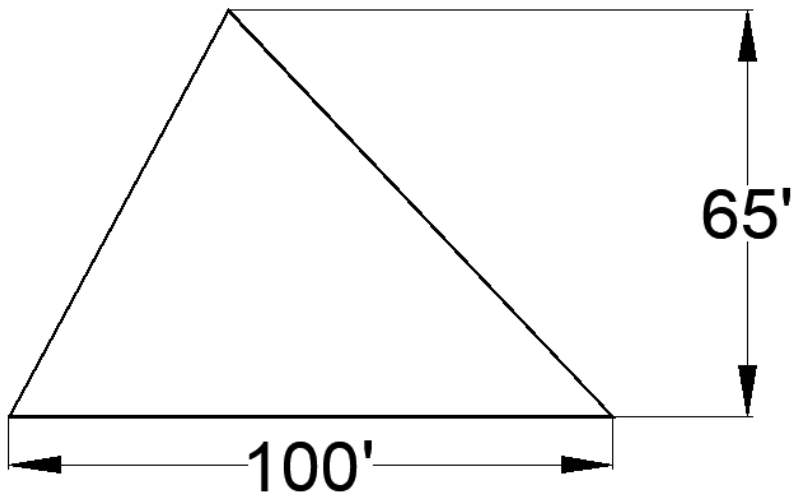


- a. 1.9'
- b. 2.1'
- c. 4.193'
- d. None apply

74. A line parallel to the direction of gravity is known as:

- a. a horizontal line
- b. a level line
- c. a vertical line
- d. a level line
- e. None apply

75. The following triangular piece of land has what area?



- a. 6500 ft²
- b. 5230 ft²
- c. 0.15 acres

- d. 0.075 acres
- e. 13,250 ft²

76. What is the **best** grade below for structural light framing lumber?

- a. Construction
- b. Select Structural
- c. No. 1
- d. Standard
- e. None apply

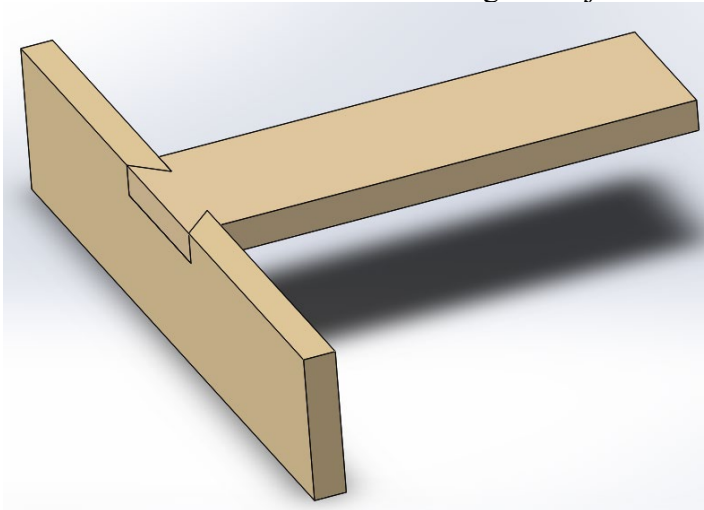
77. What are the actual dimensions of an S4S 2 x 10 plank?

- a. 2" x 10"
- b. 1-3/4" x 9-1/2"
- c. 1-1/2" x 9-1/2"
- d. 1-1/2" x 9-1/4"
- e. None apply

78. Which tool below is meant for sinking the head of a finishing nail below the wood surface?

- a. sinker
- b. drift punch
- c. line-up punch
- d. nail set
- e. clincher

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



- a. Dado
- b. Rabbet
- c. Miter
- d. Dovetail

80. Calculate the board footage for 20 pieces of 2" x 6" x 14' (S4S)

- a. 3360 bd-ft.
- b. 280 bd-ft.
- c. 140 bd-ft.
- d. 23.3 bd-ft.

- e. None apply
81. The wall thickness terms “Standard”, “Double-Extra-Heavy”, and “Extra-Heavy” refer to **what type** of plumbing material?
- a. Copper
 - b. Galvanized steel
 - c. Black pipe
 - d. Brass
 - e. Galvanized and black steel pipe
82. The outside diameters of Type K, L, and M copper pipe are the same.
- a. True
 - b. False
 - c. Not enough information given
83. Both copper pipe and copper tubing may be joined with flare-type connections.
- a. True
 - b. False
84. “PE” plastic pipe is:
- a. Usually black in color, Polyvinyl Chloride
 - b. Usually white in color, Polyethylene
 - c. Usually black in color, Polyethylene
 - d. Usually white in color, Chlorinated PVC
 - e. None apply
85. Primer and glue are usually used with PE plastic pipe.
- a. True
 - b. False
86. Which bolt below requires the smallest **tap** hole?
- a. 3/8”-NC
 - b. 3/8”-NF
 - c. 1/2”-NC
 - d. 1/2”-NF
87. Which of the three taps below is easiest to **start** cutting threads?
- a. Plug
 - b. Taper
 - c. Bottoming
 - d. None apply
88. Which one of the following shapes is **not** a standard file shape?
- a. Triangular

- b. Half-round
- c. Flat
- d. Hexagonal
- e. Round

89. Which of the following teeth designs are **not** common in metal working files?

- a. Single-cut
- b. Double-cut
- c. Triple-cut
- d. Rasp-cut
- e. Curved-cut

90. What term describes pulling or pushing a file along the piece of stock, while the file is positioned in a perpendicular direction?

- a. Filing
- b. Rasping
- c. Draw filing
- d. Ripping
- e. Burnishing

91. The center hole in an oxy-acetylene cutting torch tip is for:

- a. Acetylene gas
- b. Oxygen cutting gas
- c. Both acetylene and oxygen gases
- d. Compressed shop air
- e. Nitrogen gas

92. The outer holes in an oxy-acetylene cutting torch tip is for:

- a. Acetylene gas
- b. Oxygen gas
- c. Both a and b above
- d. Oxygen cutting gas

93. It is a good practice to never open an acetylene cylinder valve more than $\frac{1}{2}$ turn. Why?

- a. Because acetylene gas is unstable at higher pressures.
- b. Just in case you have to turn it off in an emergency.
- c. Those valves are prone to sticking.
- d. None apply

94. 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

95. Penetrating a piece of steel to create **hole** with the oxy-acetylene torch is referred to as:

- a. Punching

- b. Puncturing
- c. Piercing
- d. Blowing
- e. Plowing

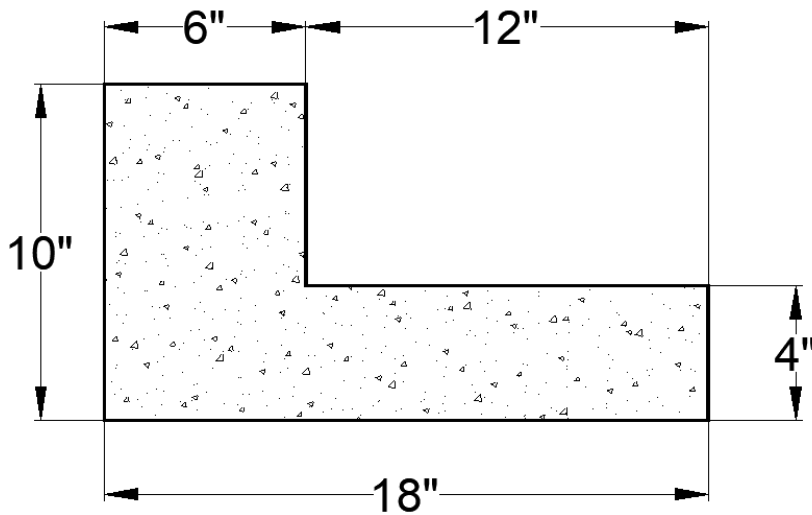
96. In a common fine aggregate **silt** test, the four ingredients settle from top to bottom in the following order:

- a. Water, sand, silt, clay
- b. Water, silt, clay, sand
- c. Water, clay, sand, silt
- d. Water, clay, silt, sand

97. One sack of **cement** has:

- a. 94 lb of cement
- b. 1 ft³ of cement
- c. Enough cement for approximately 5 ft³ of concrete.
- d. All apply

98. A concrete curb has the following cross section:



What is the volume of the concrete if the curb is 20' long?

- a. 2160 ft³
 - b. 3600 in³
 - c. 0.56 yd³
 - d. 15 ft³
 - e. 0.56 ft³
99. When discussing how much **cement** is required, it is very common to refer to the “recipe” with a “sack mix number”. For example, a “5 sack mix” means you would need **5 sacks of cement** per **cubic yard of concrete**. For the job above, if you used a “5 sack mix”, how many sacks of cement would you buy at your neighborhood Lowes or Home Depot?
- a. 5
 - b. 3
 - c. 1
 - d. 20
100. Raking off the excess placed concrete, so it is flush with the top of the forms is referred to as:

- a. Striking
- b. Floating
- c. Screeding
- d. Brooming
- e. Curing