

Minnesota FFA Agriculture Mechanics Career Development Event

WRITTEN EXAMINATION 2016

You will have **30 minutes** to complete this examination. Answer the multiple choice questions by selecting the one best answer for each question. Mark your answers on the **answer sheet** provided.

Do not write on this exam

Building Construction

1. What is the length of a 16d nail?
A. 3" B. 3 1/4" C. 3 1/2" D. 3 3/4"
2. To protect wood framing, sheathing, and siding from moisture in the soil, it is generally recommended that foundations extend above the finished grade by _____.
A. 6"
B. 8"
C. 10"
D. 12"
3. In the acronym EMC, the E stands for
A. elasticity B.
equilateral C.
equalized D.
equilibrium
4. A batter board assembly consists of stakes and one or more horizontal members. Each horizontal member is called a _____.
A. ledger
B. bracket
C. brace
D. leveling strip
5. In platform construction, wall-framing members include sole plates, top plates, studs, headers, and _____.
A. beams
B. joists
C. sheathing
D. sills

6. Three-tab, square-butt shingles are commonly laid so the cutouts are centered over the tab in the course directly below. The first course is started with a full strip and the second course is started with _____.
- A. a strip from which one tab has been removed
 - B. a strip from which one-half tab has been cut away
 - C. one-half of a single tab
7. _____ is manufactured in sheets and other forms and have higher R - values per inch than other forms of insulation.
- A. Batt insulation
 - B. Rigid insulation
 - C. Expanded polystyrene foam insulation
 - D. Extruded polystyrene foam insulation
8. Carpenters must have a good understanding of fire protection and control. For example, they should know that special methods must be used to control fires caused by electrical wiring or equipment. This type of fire is referred to as a _____ fire.
- A. Class A
 - B. Class B
 - C. Class C
 - D. Class D
9. Which of the following is ***not*** a valid safety rule for operating a standard table saw?
- A. Set the blade so it extends 1/4" above the stock to be cut.
 - B. When ripping stock freehand, do not use the fence.
 - C. Always use push sticks when ripping short, narrow pieces.
 - D. Maintain a 4" margin of safety even when the guard is in position.
10. Headers are formed by nailing two members together with a spacer between them. The spacer should be _____ thick.
- A. 1/4"
 - B. 3/8"
 - C. 1/2"
 - D. 5/8"

Welding

11. A whipping motion is used to _____.
- A. produce a thinner weld bead
 - B. allow the weld time to cool
 - C. allow time for the flux to reduce the oxides
 - D. allow time for the flux to clean the metal surface ahead of the arc

12. The approximate temperature of an SMAW arc is ____ °F.
- A. 6500–7000
 - B. 10,000–10,500
 - C. 5600–6300
 - D. 7600–8500
13. The weave bead width should be ____ the diameter of the electrode being used.
- A. the same as
 - B. no wider than 2–3 times
 - C. no wider than 4 times
 - D. no wider than 6 times
14. Where should a weld be restarted on a previously unfinished bead?
- A. At the leading edge of the previous bead.
 - B. In the middle of the previous bead crater.
 - C. At the trailing edge of the previous bead.
 - D. At any point on the bead.
15. ____ will help prevent undercutting.
- A. Increasing the welding speed
 - B. Stopping momentarily at the upper end of each electrode movement
 - C. Using a longer arc length
 - D. Increasing the welding current slightly
16. T / F A stringer bead width should be 2 to 3 times the electrode diameter.
17. T / F When multiple beads are used, it is *not* always necessary to remove slag between beads.
18. T / F Regardless of the motion shape, a backward slant of the electrode should always be used when a fillet weld is being made in the horizontal position.
19. T / F The reversal of current in an AC circuit virtually eliminates arc blow.
20. T / F With a constant current welding machine, the amount of amperage will increase if the connections at the work or electrode holder are loose.

Electrical

21. What combination of switches may be used to control a light from four locations?
- A. Four 3-way switches
 - B. Two 3-way switches and two 4-way switches
 - C. Three 3-way switches and one 4-way switch

22. Which of the following is a cable type that would be appropriate to use in a barn where the conditions will be moist?
- A. NM
 - B. GE
 - C. UF
 - D. TW
23. The major purpose of a ground-fault circuit interrupter is:
- A. to protect equipment from damage due to overloading.
 - B. as a replacement for fuses in homes.
 - C. to protect humans from electrical shock due to a ground fault.
 - D. to protect appliances in case of a natural disaster.
24. The brass-colored terminals of a receptacle represent the _____ terminals.
- A. Neutral
 - B. White
 - C. Hot
 - D. Ground.
25. What is the allowable number of conductors under each terminal screw?
- A. 1
 - B. 2
 - C. 3
 - D. 4
26. In the service entrance box the neutral is normally:
- A. Not switched or over-current protected.
 - B. Over current protected but not switched.
 - C. Switched but not over current protected.
 - D. Switched and over current protected.
27. A wall switch which is normally used to control a light from one location is:
- A. DPST
 - B. SPST
 - C. SPDT
 - D. DPDT
28. Which of the following conduits should be used for severe corrosive environment?
- A. rigid steel
 - B. rigid non-metallic
 - C. rigid aluminum
 - D. electrical metallic tubing (EMT)
29. Which factor does **not** affect resistance?
- A. Conductor temperature
 - B. Conductor length
 - C. Type of conduit
 - D. Conductor size (Diameter)

30. The size of wire for farm wiring is determined by:
- A. The relative costs of the conductors.
 - B. The ampacity required in the circuit- strength of the wire and voltage drop.
 - C. The distance from the generation facility.
 - D. The number of individual circuits in the installation

Small Engine

31. A 12 volt battery connected in series? A. Doubles Voltage B. Doubles CCA
32. A 12 volt automotive battery has _____ cells.
- A. 1 C. 6
 - B. 2 D. 12
33. On most small engines the crankshaft endplay is set by:
- A. Crankshaft main seal
 - B. The gasket between the block and seal housing
 - C. Shims on the crankshaft and camshaft
 - D. Springs behind the crankshaft
34. Convert 5/8 to decimals. Nearest 10,000th.
- A. .5938
 - B. .43475
 - C. .5625
 - D. .6250
35. Oil rating 10W30 the W refers to what:
- A. Winter
 - B. Weight
36. The bottom ring on the piston is called what:
- A. Keystone ring
 - B. Oil ring
 - C. Compression ring
 - D. E ring
37. Plastigage is used to measure:
- A. Cylinder taper
 - B. Cylinder out of round
 - C. Bearing clearance
 - D. Timing gear backlash
38. Convert bar to psi multiply by _____?
- A. 17.2 B. 10 C. 14.5 D. 2.5
39. True or False. Methane is a rating for diesel fuel.
40. The purpose of a rectifier for charging the battery on a lawn garden tractors:
- A. Determines ground
 - B. Converts AC to DC current
 - C. The charging rate
 - D. Operates the lights on the tractor

Forage Harvester

41. A shear bolt is used for:
- A. Determines how much horse power can be use on this machine
 - B. Helps increase efficiency of the machine
 - C. Prevent further damage to the machine
 - D. Determines the size of cut
42. True or false. A harvester can have two engines to operate.
43. What is the square feet in one acre?
- A. 43,560
 - B. 435
 - C. 4356
 - D. 5,280
44. Identify a US bolt grade 5 by looking at the head for:
- A. Now marking
 - B. Letters
 - C. 3 lines
 - D. A series of dots and dashes
45. Thread pitch is used to measuring what:
- A. The difference of course thread and fine thread.
 - B. Thread to thread distance for metric bolts.
 - C. The strength of a bolt
 - D. The length of a bolt
46. Crop processor used on choppers does what?
- A. Dries the crop.
 - B. Identifies the crop size.
 - C. Cracking individual corn kernel.
47. True or False. Never work on a machine when it is moving.
48. True or False. Large self-propelled choppers must have 36 volts for starting 12 volts for everything else.
49. True or False. The smaller screen size the larger the crop.
50. True or False. The higher relative feed value (RFV) the better the quality?

2016 MN FFA Agriculture Mechanics Exam Key

1. C
2. B
3. D
4. A
5. C
6. B
7. B
8. C
9. B
- 10.C
- 11.B
- 12.A
- 13.D
- 14.A
- 15.B
- 16.A
- 17.B
- 18.A
- 19.A
- 20.B
- 21.B
- 22.C
- 23.C
- 24.C
- 25.A
- 26.A
- 27.B
- 28.B
- 29.C
- 30.D
- 31.A
- 32.C
- 33.B
- 34.D
- 35.B
- 36.B
- 37.C
- 38.C
- 39.B
- 40.B
- 41.C
- 42.A
- 43.A
- 44.C
- 45.B
- 46.C
- 47.A
- 48.A
- 49.B
- 50.A