IOWA FFA
CAREER DEVELOPMENT EVENT
AGRICULTURAL MECHANICS
2005
WRITTEN EXAMINATION

IOWA STATE UNIVERSITY
AMES, IOWA
JUNE 9, 2005

LIVING TO SERVE
2005 Iowa FFA Agricultural Mechanics Career Development Event

State of Iowa
DEPARTMENT OF EDUCATION
Career Education Division
Grimes State Office Building
Des Moines, IA 50319

CONTESTANT NAME _____________________________
CONTESTANT SCHOOL ___________________________

WRITTEN EXAM

Darken the circle 0 under A, B, C, or D indicating the one best answer

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2005
IOWA FFA AGRICULTURAL MECHANICS CDE
WRITTEN TEST ANSWER KEY
1. C  31. C
2. B  32. A
3. A  33. D
4. D  34. A
5. B  35. B
6. D  36. D
7. C  37. B
8. A  38. A
10. D  40. C
11. A  41. D
12. D  42. A
13. C  43. D
14. D  44. B
15. B  45. A
16. D  46. C
17. B  47. C
18. C  48. A
20. A  50. D
21. D  51. C
22. A  52. A
23. C  53. B
24. A  54. A
25. A  55. C
26. D  56. D
27. C  57. A
28. B  58. B
29. C  59. A
30. A  60. D
1. __________ is a semi-transparent material used in metal building construction to allow light into the building through the sidewalls and/or roof.
   A. Silicone
   B. Neoprene
   C. Filon
   D. Agri-Rib

2. __________ is a building material made of glued wood particles, pressed into 4’ x 8’ sheets.
   A. High density polystyrene
   B. Oriented Strand Board
   C. Veneer
   D. “Green board”

3. If you need to trim the edges of a corrugated, galvanized, steel roof, __________ would be the most practical method.
   A. cut the edge with a Skil-saw with an old blade installed backwards in the saw
   B. cut the edge with an oxy-acetylene cutting torch
   C. cut the edge with a cross-cut handsaw
   D. cut the edge with a diamond impregnated cut-off saw

4. __________ welding uses the oxy-acetylene welding and cutting torch set.
   A. Wire
   B. Arc
   C. TIG
   D. Fusion

5. __________ are roof framework units, assembled on the ground at the building site, or at a factory.
   A. Rafters
   B. Trusses
   C. Joists
   D. Stringers

6. The square poles in pole building construction are generally placed __________ feet O.C.
   A. 2
   B. 4
   C. 6
   D. 8
7. 2 x 4’s used for sidewall girts in pole building construction, are usually placed __________.
   A. 2 feet apart, vertically
   B. 2 feet apart, in a square pattern
   C. 2 feet apart, horizontally
   D. diagonally, 2 feet apart

8. __________ are used for fastening steel sidewall panels on a pole building.
   A. drill-point screws with neoprene washers
   B. sheet metal screws
   C. wood screws
   D. aluminum screws

9. __________ should not be used in covering the roof and sidewalls of a pole building.
   A. ridged, enameled steel panels
   B. galvanized, corrugated steel panels
   C. completely flat steel panels
   D. wood

10. Safety considerations for pole building construction should include __________.
    A. precipitation
    B. wind
    C. on-lookers
    D. all of the above

11. Pole building sidewall and roofing sheets are generally 28 __________ thickness.
    A. gauge
    B. thousandths
    C. inches
    D. mm

12. A __________ is the framing member, placed over a large door opening, in constructing a pole building.
    A. stud
    B. plate
    C. sill
    D. header

13. Current self-propelled sprayers can be operated at speeds up to __________ MPH in smooth fields when spraying crop chemicals.
    A. 2
    B. 5
    C. 15-18
    D. 40

14. Broadcast spraying of non-specific pesticides should be __________.
    A. the first choice in controlling weeds
    B. used to control giant foxtail
    C. used on organically grown crops
    D. used as a last resort to control weeds
15. __________ pesticides can be used to control pests in organic crops.
   A. All chemical
   B. Naturally sourced
   C. No
   D. Only Monsanto

16. __________ are used to mark the edge of the last pass with the crop sprayer.
   A. Foam markers
   B. Mechanical markers
   C. GPS guidance
   D. A or C

17. The nozzle flow rate in GPM in the following example, is __________ gallons per minute.
   (30 inch rows, 2 nozzles per row)
   
   Formula: \( GPM = \frac{GPA \times S \times W}{5940} \)
   \[ GPM = \frac{20 \times 6 \times 15}{5940} \]
   GPM= gallons per minute
   GPA= gallons per acre (20)
   S= field speed in miles per hour (6)
   W= width of nozzle, in inches (15)
   5940= constant

   A. 3.003
   B. 0.3003
   C. 30.03
   D. 20

18. Integrated Pest Management is an effective and environmentally sensitive approach to pest management that relies on __________.
   A. a single pest control method
   B. non-chemical control of pests, only
   C. all appropriate pest management options
   D. chemicals, only to control pests

19. Asian Soybean Rust is a(n) __________.
   A. weed
   B. fungus
   C. insect
   D. bug

20. Asian Soybean Rust is a potential problem which will likely invade Iowa. __________ can be used to spray for this pest.
   A. Syngenta Quadris
   B. Roundup
   C. Northstar
   D. GreenStar

21. __________ when you are operating a sprayer for the local coop.
   A. Eat in the cab of the sprayer to save time
   B. Dispose of excess spray in the ditch, before returning to town
   C. Spray upwind of vulnerable plants, trees and gardens
   D. Be safety conscious at all times, both on-road and off-road.
22. All of the following companies, except _________ manufacture field sprayers.
   A. GM
   B. AGCO
   C. John Deere
   D. CNH

23. The John Deere 4920, self-propelled sprayer, owned by the Fort Atkinson Farmers Coop, can be operated by _________.
   A. any employee of the coop
   B. any farmer-member of the coop
   C. an employee with a commercial pesticide applicators license
   D. only the chemical manager of the coop

24. Self-propelled sprayers, including the JD 4920 and the CaseIH Patriot, should be operated with the spray boom _________.
   A. at the recommended clearance above the crop
   B. as high as possible
   C. 6 inches below the top of the crop
   D. 30 inches above the crop, minimum

ENVIRONMENT AND NATURAL RESOURCES

25. All of the following, except _________, are brand names of integrated farm equipment GPS systems.
   A. OnStar
   B. AFS
   C. GreenStar
   D. Fieldstar

26. The ________ Survey is an operational program within the Bureau of Land Management, US Department of the Interior.
   A. NAVSTAR
   B. Navistar
   C. TempStar
   D. Cadastral

27. NAVSTAR (NAVigation System with Time and Ranging) is a constellation of ________ satellites orbiting the earth that are used in the GPS.
   A. 3
   B. 12
   C. 27
   D. 48

28. A leveling rod is used in conjunction with another tool by a surveyor to _________.
   A. record compass headings
   B. determine elevation
   C. determine distance
   D. none of the above
29. There are ________ sections in a township.
   A. 640
   B. 6
   C. 36
   D. 16

30. Satellites in geosynchronous orbits, ________.
    A. orbit 19,100 miles above a fixed spot on the earth
    B. orbit the earth on a regular orbit
    C. orbit the earth in a random pattern
    D. orbit the earth at 500 miles above the surface

31. Determining position, using 4 satellites to determine DISTANCE, is called ________.
    A. GDOP
    B. selective availability
    C. trilateration
    D. triangulation

32. GPS satellites orbit the earth at ________ elevation above the earth’s surface.
    A. 12,600 miles
    B. 12,600 kilometers
    C. 126,000 miles
    D. 1260 miles

33. ________ is used to determine location by using angles.
    A. GDOP
    B. Selective Availability
    C. trilateration
    D. triangulation

34. There are ________ acres in a section.
    A. 640
    B. 40
    C. 80
    D. 120

35. The John Deere GreenStar, AutoTrac, assisted steering, used on the 4920 self-propelled sprayer, can provide an accuracy in steering the sprayer, as close as ________.
    A. plus or minus 7 feet
    B. plus or minus 4 inches
    C. plus or minus 27 feet
    D. plus or minus .001 inch

36. There are ________ acres in an area measuring 40 rods by 120 rods.
    A. 80
    B. 20
    C. 120
    D. 30
37. One of these 3 signal words; __________, must be used on the pesticide label to describe the relative toxicity to humans of the active ingredient in the pesticide.
   A. danger, lethal, irritant
   B. caution, warning, danger
   C. notice, caution, danger
   D. dangerous, extreme, lethal

38. “Routes of Entry” statements on pesticide labels describe __________.
   A. how pesticides can enter the human body
   B. how pesticides can enter waterways
   C. how pesticides can enter the environment
   D. how pesticides enter the targeted pest

39. Restricted use pesticides can be applied by __________.
   A. any applicator
   B. trained and certified applicators
   C. Terminex employees only
   D. only employees of the pesticide manufacturer

40. BT hybrids produce insect specific toxins that make the corn plant resistant to __________.
   A. cutworms
   B. wireworms
   C. European corn borers
   D. SCN

41. Glyphosate is the active ingredient in __________ herbicide.
   A. Liberty Link
   B. Fortress 5G
   C. Northstar
   D. Roundup

42. Rinsates are __________ wastes.
   A. water used to rinse spraying equipment, which contains some remaining pesticide.
   B. clear water added to mix the ingredients in the spray tank
   C. pesticides at strength of use
   D. pure pesticide

43. Cutworms can be controlled with __________.
   A. Roundup
   B. Northstar
   C. SPF 250
   D. Fortress 5G

44. If allowed by the pesticide label, pesticide containers should be disposed of __________ in the landfill.
   A. immediately after emptying
   B. after proper rinsing
   C. after incineration
   D. after being stored empty for 1 year
45. Pesticides can be applied at __________ rate.
   A. only the rate specified on the label
   B. up to twice the recommended amount
   C. only ½ of the rate specified on black soil
   D. none of the above

46. Roundup is a contact herbicide. This means that it must be applied __________.
   A. before the weeds emerge
   B. before working the soil
   C. after the weeds have emerged and are 2-6 inches tall
   D. while planting the crop

47. If the corn field was sprayed with Roundup last year, the farmer can __________ this year.
   A. plant only Roundup Ready crops
   B. plant Roundup Ready corn and get residual effects from last year’s Roundup
   C. plant any crop he desires, because Roundup is not a residual herbicide
   D. Plant Pioneer corn only

48. __________ is a pre-emerge herbicide for corn.
   A. Lumax
   B. Roundup
   C. DuPont Resolve
   D. Northstar

49. The electronic ignition module on a Briggs and Stratton engine is a(n) __________.
   A. electron
   B. Delcotron
   C. Magnetron
   D. Spark-O-Matic

50. Valve overlap on a small 4-stroke cycle engine occurs on the __________ stroke.
   A. intake
   B. compression
   C. power
   D. exhaust

51. On a diesel small engine, __________ is compressed on the compression stroke.
   A. air and diesel fuel
   B. air and gasoline
   C. air only
   D. fuel only

52. When stopping a small engine with magneto ignition, the following happens:
   A. the ignition is grounded
   B. the wire from the switch to the ignition is open
   C. the wire from the switch to the ignition is powered
   D. none of the above
53. Briggs and Stratton is now owned by ______.  
   A. Honda  
   B. MTD  
   C. Cub Cadet  
   D. Kubota

54. Small engines _______ 10% ethanol blended gasoline.  
   A. are approved to use  
   B. can not use  
   C. can use for light loads only  
   D. can only be used at high altitudes

55. Small engines should be operated in a well-ventilated area because of ______ in the exhaust.  
   A. carbon dioxide  
   B. H₂O  
   C. carbon monoxide  
   D. heat

56. When using the small engine for the last time in the fall, do all of the following, except ______.  
   A. run the engine out of fuel  
   B. clean off all debris  
   C. put Sta-Bil in the fuel tank  
   D. fill the tank with clean fuel

57. The choke on a small engine ______.  
   A. enriches the fuel mixture  
   B. leans out the fuel mixture  
   C. allows less air and fuel into the combustion chamber  
   D. advances the timing

58. In a 4-stroke cycle small engine, the crankshaft rotates ______ degrees and the camshaft rotates ______ degrees in one complete sequence.  
   A. 360, 360  
   B. 720, 360  
   C. 360, 720  
   D. 720, 720

59. ______ is the air-fuel ratio, by weight, in a small engine.  
   A. 100-1  
   B. 14-1  
   C. 1-1  
   D. 1-14

60. Late timing in a small engine, used on a lawnmower, could be caused by ______.  
   A. the flywheel key is completely sheared and the flywheel can rotate on the crankshaft  
   B. the engine is flooded  
   C. the spark plug is grounded out  
   D. the flywheel key is partially sheared by having struck a big rock with the lawnmower blade