ANSWERS TO EXAMINATION Do Not Distribute

2010 Examination for the National Agricultural Mechanics Career Development Event: INTEGRATED PEST MANAGEMENT

Mark all answers on the Scantron sheet using a pencil. *Read each question carefully and identify the single correct answer. Use the blank sheet(s) of paper to do all scratch work. Students will need a calculator to complete this examination, but they are* ***not allowed*** *to share a calculator with another student.*

SECTION 1: MACHINERY & EQUIPMENT SYSTEMS Question 1-20

1. Which one of the following must be present in the soil for seed germination?
A. Water
B. Nitrogen
C. Potassium
D. Phosphorous
Answer A (JD, FMO, Planting, p. 11)

2. When moving a tractor up a steep incline, which of the following techniques is recommended?
A. Back up the incline
B. Steer straight while driving up the incline
C. Angle about 45 degree along the slope while driving up the incline
D. Have someone stand on the front of the tractor while driving up the slope
Answer A Farm & Ranch Safety Management, 1994, page 282

3. What is the purpose of a press wheel on a planter?
A. Opens the soil for seed planting
B. Firms the soil after the seed is covered
C. Presses the seed to the bottom of the groove
D. Distributes the seed evenly throughout the groove
Answer B (JD, FMO, Planting, p. 41)

4. Which of the following variables directly influence power output of a tractor's power takeoff (PTO)?
A. PTO torque and rotational speed
B. Tractor travel speed and direction
C. Tractor wheel diameter and travel speed
D. PTO diameter and tractor engine oil pressure
Answer A Machinery Management – John Deere

5. How many splines are on the shaft of a 540 rpm PTO stub?
a. 6 splines
b. 10 splines
c. 20 splines
d. 21 splines
Answer A (JD, FMO, Planting, p. 73)

6. Which of the following factors directly influence the field capacity of agricultural equipment?
A. Power takeoff (PTO) speed and temperature
B. Machine weight and ground clearance
C. Travel speed and operating efficiency
D. Machine height and length
Answer C Machinery Management – John Deere

7. How does an underinflated ground driven planter drive tire affect the number of seeds planted per acre?
a. No affect
b. Over planting occurs
c. Under planting occurs
d. Correct amount of seed is planted per acre
Answer B (JD, FMO, Planting, p. 79)

8. When an engine is operated in an enclosed shed, what exhaust gas presents a hazard to people and animals?
A. Hydrogen Peroxide
B. Carbon Monoxide
C. Hydrogen Sulfide

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D. Carbon Dioxide
Answer B ***http://www.cdc.gov/nasd/docs/d000901-d001000/d000918/d000918.html***

9. When a tractor is equipped with a rollover protective structure (ROPS) and a seat belt, what is the purpose of the ROPS?
A. Lower the tractor's center of gravity
B. Prevent head injuries caused by falling objects
C. Limit most rollovers to 90 degrees and when the seatbelt is worn, to protect the operator
D. Limit most rollovers to 180 degrees and when the seatbelt is not worn, to protect the operator
Answer C Safe Grain and Silage Handling, Karl Snyder and Thomas Bobick, NIOSH, 1995 page 1-2 http://www.cdc.gov/niosh/contents.html

10. Which of the following is an acceptable way to dispose of empty herbicide containers after use?
A. Rinse once and burn on site
B. Reuse the container to store nontoxic liquids
C. Triple rinse and puncture
D. Cut the top out and reuse for food storage
Answer C 2009 Missouri Pest Management Guide, 2009, University of Missouri Extension, p 9.

11. What is the term for a herbicide that is applied to kill a plant before it emerges from the surface of the soil?
A. Post emergence
B. Pre-emergence
C. Incorporated
D. Aerated
Answer B 2009 Missouri Pest Management Guide, 2009, University of Missouri Extension, p 22.

12. What type of pest management systems relies on the physical removal of pests such as hoeing weeds?
A. Biological
B. Chemical
C. Incorporated
D. Mechanical
Answer D Midwest Home Fruit Production Guide, 2009, The Ohio State University Extension, p 84. http://ohioline.osu.edu/b940/pdf/b940_ch7.pdf

13. Applying insecticide often eliminates natural enemies of the pest insects; what term describes the process where a pest population recovers from a pesticide treatment?
A. Resurgence
B. Residual
C. Reactant
D. Mechanical
Answer A Biointensive Integrated Pest Management, 2010. National Center for Appropriate Technology. http://attra.ncat.org/attra-pub/ipm.html

14. What is the term/practice for planting a different crop to prevent the buildup of pest organisms that feed on a particular type of plant?
A. Multiple cropping
B. Strip cropping
C. Crop rotation
D. Intercropping
Answer C Biointensive Integrated Pest Management, 2010. National Center for Appropriate Technology. http://attra.ncat.org/attra-pub/ipm.html

15. Which of the following terms describes the inspection of a field to determine if there is a pest problem?
A. Scouting
B. Eradication
C. Cultural control
D. Resistance
Answer A Biointensive Integrated Pest Management, 2010. National Center for Appropriate Technology. http://attra.ncat.org/attra-pub/ipm.html

16. Using living organisms to control pest populations is known as what type of control system?
A. Biological
B. Chemical
C. Mechanical
D. Physical
Answer A Biointensive Integrated Pest Management, 2010. National Center for Appropriate Technology. http://attra.ncat.org/attra-pub/ipm.html

17. The use of botanical and synthetic pesticides is known as what type of control system?
A. Biological
B. Chemical

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C. Mechanical
D. Physical
Answer B Biointensive Integrated Pest Management, 2010. National Center for Appropriate Technology. http://attra.ncat.org/attra-pub/ipm.html

18. A planter has a 20-foot effective swath width, travels at 5 miles per hour, and operates with a field efficiency of 80 percent. What is the approximate effective field capacity (EFC) of the planter in acres per hour?
Note: EFC in acres per hour = width of implement in feet x speed in miles per hour x efficiency / 8.25
A. 7.3 acres per hour
B. 8.0 acres per hour
C. 9.7 acres per hour
D. 11.0 acres per hour
Answer C: 9.696969 ac/hr =[(20 ft) x (5 mph) x (0.80)] / 8.25

19. What is the approximate speed, in miles per hour, of a planter that travels 200 feet in 25.6 seconds?
Note: 5,280 ft = 1 mile 3600 seconds = 1 hour
A. 3.9 miles per hour
B. 5.3 miles per hour
C. 6.5 miles per hour
D. 8.7 miles per hour
Answer B: 5.3267 mph = (200 ft / 25.6 sec) x (3600 sec / 1 hr) x (1 mi / 5,280 ft)

20. If a farm cooperative charges $17.00 per acre to apply pesticide, what is the total cost to treat six fields with the following acreages: 139 acres, 245 acres, 180 acres, 375 acres, 607 acres, and 495 acres?
A. $34,697.00
B. $45,831.00
C. $52,488.00
D. $61,625.00
Answer A: $34,697 = (139 ac. + 245 ac. + 180 ac. + 375 ac. + 607 ac. + 495 ac) x ($17.00)

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SECTION 2: INDUSTRY AND MARKETING SYSTEMS Question 21-40

21. Which of the following would be considered a liability in farm accounting?
A. The herbicide bill that you owe to the farm supply store
B. Money in your checking account
C. A debt owed to you by another farmer
D. The cash value of your life insurance policy
Answer A: Farm and Ranch Business Management, 2004. John Deere, p 3-2 to 3-3

22. What is the name for the decrease in the value of a capital asset that occurs over time?
A. Repair and maintenance
B. Obsolescence
C. Depreciation
D. Capital accrual
Answer C: Farm and Ranch Business Management, 2004. John Deere, p A-3

23. In economics, applying any production input, such as herbicides, in excess of the required amount, leads to which of the following?
A. Diminishing returns
B. Profit maximization
C. Differentiated input function
D. Liquidity
Answer A: Farm and Ranch Business Management, 2004. John Deere, p 5-4

24. Which of the following correctly describes the owner(s) of the cooperative?
A. Stockholders
B. Private investors
C. Member-patrons of the cooperative
D. A sole proprietor
Answer C: Farm and Ranch Business Management, 2004. John Deere, p 10-11

25. Which type of pesticide can only be purchased by a certified pesticide applicator?
A. General use pesticide
B. Special use pesticide
C. Reserve use pesticide

D. Restricted use pesticide
Answer D : Farm and Ranch Business Management, 2004. John Deere, p 11-23

26. What type of insurance gives a farmer protection against financial loss if a chemical application drifts onto an adjacent farm and damages a neighbor's crop?
A. Accident insurance
B. Property insurance
C. Liability insurance
D. Crop insurance
Answer C: Farm and Ranch Business Management, 2004. John Deere, p 11-13

27. In economics, a product or service has this characteristic if it satisfies a consumer's need.
A. Elasticity
B. Leverage
C. Parity
D. Utility
Answer D: Farm and Ranch Business Management, 2004. John Deere, p 7-2

28. What type of business arrangement gives a farmer the right to use a self-propelled spray rig owned by a machinery dealership for a certain period of time in exchange for one or more payments?
A. Barter
B. Exchange
C. Lease
D. Sale
Answer C: Farm and Ranch Business Management, 2004. John Deere, p A-6

29. Which of the following is a variable cost associated with owning fertilizer application equipment?
A. Depreciation
B. Chemical expense
C. Interest expense
D. Annual taxes
Answer B:

30. Which type of fuel is most efficiently converted into work by a tractor's engine?
A. Gasoline
B. Diesel fuel
C. LP-gas
D. Ethanol
Answer B

31. Which of the following is an example of a variable cost for a grain elevator employing seasonal workers?
A. Monthly telephone charge for local calls
B. Property tax on elevator
C. Depreciation on a grain auger
D. Overtime wages paid to hired labor
Answer D at http://uwadmnweb.uwyo.edu/SBDC/fod/258.html

32. Which of the following is a variable cost associated with owning grain handling equipment?
A. The operating costs not declared on income tax expenses
B. Depreciation costs
C. Fuel/energy costs
D. Principal payment on a fixed loan
Answer C

33. Which of the following is an example of a variable cost for a pesticide company that is hiring certified applicators?
A. Fuel cost
B. School tax on the company's property
C. Casualty insurance on transport trailers
D. Depreciation on a new semi-truck with tanker
Answer A

34. In this accounting system, an expense is recognized as an expense before cash is paid.
A. Cash accounting system
B. Accrual accounting system
C. Liability accounting system
D. Expense accounting system

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Answer A - http://accountinginfo.com/study/accrual-101.htm

35. Which of the following are all fixed costs associated with operating a farm?
A. Soil conservation losses, lost crop repayments, death benefits, and federal incentive payments
B. The opportunity and entertainment costs not declared on Schedule F of the IRS 1040 Form
C. Shelter, interest, taxes, depreciation, and insurance
D. Livestock depreciation and all operating costs
Answer C Fundamentals of Machine Operation, Wendell Bowers, Deere & Company, 1981

36. Which one of the following costs is generally considered to vary with individual operator use?
A. Annual cost for repairs
B. Annual cost for equipment shelter
C. Annual cost for equipment taxes
D. Annual cost for the interest on the loan for the equipment's purchase
Answer: A.

37. Which of the following 2WD tractor weighting schemes is most agreed upon for a heavy duty chisel plow?
A. 50 percent on the front and 50 percent on the rear
B. 40 percent on the front and 60 percent on the rear
C. 35 percent on the front and 65 percent on the rear
D. 25 percent on the front and 75 percent on the rear
Answer D http://www.extension.iastate.edu/Publications/PM2089G.pdf

38. If sales tax is 7.25 percent, what is the approximate total cost including the sales tax, for an item marked $636.94?
A. $225.58
B. $319.63
C. $497.36
D. $683.12
Answer D: $683.1182 = ($636.94) x (1.0725)

39. It costs $5.45 per acre per year to have a crop service scout for insect pests. What will be the approximate yearly charge to scout a field measuring 2588 feet wide and 2409 feet long? Note: 1 acre = 43,560 square feet
A. $679 per year
B. $780 per year
C. $867 per year
D. $987 per year
Answer B: $ 780.0271 = ($5.45/ac) x [(2588 ft) x (2409 ft)] x (1 ac/43,560 ft^2)

40. A label specifies that pesticide formulation be applied at the rate of 6.5 ounces per acre. Approximately how many acres will one gallon of this pesticide formulation treat? Note: 1 gallon = 128 ounces
A. 16.5 acres per gallon
B. 19.7 acres per gallon
C. 22.9 acres per gallon
D. 25.3 acres per gallon
Answer B: 19.6923 ac/ gal = (1 ac / 6.5 oz) x (128 oz / gal)

SECTION 3: ENERGY SYSTEMS Question 41-60

41. What material provides great resistance to the flow of electricity?
A. Insulator
B. Conductor
C. Filament
D. Commutator
Answer A (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 516)

42. What type of wire can be used for direct burial in soil?
A. Type T
B. Type TW
C. Type UF
D. Type THWN
Answer C (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 526)

43. What type of variable resistor is used to control voltage?
A. Voltmeter
B. Ammeter
C. Oscilloscope
D. Potentiometer

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Answer D (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 547)

44. What device converts light energy into electrical energy?
A. Photodiode
B. Phototransistor
C. Photovoltaic cell
D. Photoconductive cell
Answer C (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 553)

~~**45. What type of semiconductor is used to electronically control switches?**~~
~~A. Diode~~
~~B. Tyrister~~
~~C. Transistor~~
~~D. Integrated Circuit~~
~~Answer B (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 552)~~

New Question in Test
Answer: A

46. When an electrical wiring system provides power to a 230-volt motor, why is the frame of the motor grounded?
A. To complete the branch circuit
B. To prevent the motor from turning in reverse
C. To physically connect the motor to equipment frames
D. To ground the motor and reduce the likelihood of electrical shock
Answer D Fundamentals of Electricity, ASAE, pg 216

47. The grounded conductor in an electrical wiring system serves what purpose?
A. It is the neutral conductor for the electrical system
B. It is a noncurrent carrying conductor for most appliances
C. It is the unnecessary connection of an electrical conductor to earth
D. It is the only possible electrical connection between the electrical system and the earth
Answer A Agricultural Electrification, Southwestern, pg 213

48. What type of switch is used to control water levels in livestock water tanks and other areas where liquid levels must be controlled?
A. Timer switch
B. Actuator switch
C. Thermocouple
D. Float switch
Answer D (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 572)

49. If a wiring circuit has a path through which electricity can flow, it is said to have what property?
A. Switched
B. Parallel
C. Power
D. Continuity
Answer D Continuity http://a248.e.akamai.net/pix.crutchfield.com/ca/learningcenter/car/pdfs/000multi2.pdf

50. When measuring an unknown voltage with a multimeter that requires you to select a voltage, what is the recommended procedure?
A. Select the highest voltage range and work your way down
B. Select the lowest voltage range and work your way up
C. Select the voltage range closest to the voltage you expect
D. Select 120 volts
Answer A. http://a248.e.akamai.net/pix.crutchfield.com/ca/learningcenter/car/pdfs/000multi2.pdf

51. When measuring resistance with a multimeter what is the name of the units of the value measured?
A. Voltage
B. Amperage
C. Ohms
D. Continuity
Answer C Ohms http://a248.e.akamai.net/pix.crutchfield.com/ca/learningcenter/car/pdfs/000multi2.pdf

52. In an irrigation electrical wiring system, what is the result of broken and/or damaged electrical wires?
A. A closed circuit.
B. A complete circuit.
C. An open circuit.
D. A long circuit.
Answer C An open circuit. http://www.grounds-mag.com/mag/grounds_maintenance_test_irrigation_wiring/

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53. How do ohm meters work?
A. By combining the amperage and the wattage measurement of the circuit
B. By measuring the current of a component being tested
C. By passing current through the component being tested
D. By combining the voltage and the amperage measurement of the circuit
Answer C. http://www.doctronics.co.uk/meter.htm

54. What is the purpose of the ground fault circuit interrupter (GFCI)?
A. Provide protection from electrical shock
B. Signal the probability of an earthquake
C. Step up the output voltage of equipment
D. Measure stray voltage
Answer A Fundamentals of Electricity, ASAE

55. What function do sprinkler control valves perform in a sprinkler system?
A. Control the amount of water in the system
B. Direct the flow of water
C. Turn the flow of water on or off
D. Allow the water in the system to drain during cold weather
Answer C. Turn the flow of water on or off http://www.rainbird.com/documents/diy/ValveInstallTips.pdf

56. What type of zone control valve should be used underground?
A. Anti-siphon valve
B. In-line valve
C. A UL listed gate valve
D. A UL listed solenoid actuated anti-siphon valve
Answer B. In-line valve http://www.rainbird.com/documents/diy/ValveInstallTips.pdf

57. Which of the following types of valves, when properly installed, is most effective at preventing back flow?
A. Anti-siphon valve
B. In-line valve
C. A gate valve
D. A pressure limiting safety valve
Answer A. Anti-siphon valve. http://www.rainbird.com/documents/diy/ValveInstallTips.pdf

58. The monthly charge to operate a pivot irrigation system is 8 cents per kilowatt hour (KWH) for the first 1000 hours and 7.75 cents for each hour greater than 1000 hours. If the irrigation system uses 1785 KWHs of electricity during a single month, what is the monthly cost, in dollars, to operate the irrigation system? (1 Kilowatt = 1000 Watts)
A. $113.84
B. $140.84
C. $162.84
D. $191.84
Answer B. $140.8375 = (1000 KWH x $0.08/KWH) + [(1785-1000) x $0.0775] AAVIM Understanding Electricity. Pages 74-76

59. If a wattmeter measures 5800 watts of power being used by a five horsepower electric motor, operating at 230 volt, and 28 amps, what is the power factor for the motor?
Formula: Wattage = Voltage x Amperage x Power Factor
A. 0.123 or 12% power factor
B. 0.252 or 25% power factor
C. 0.901 or 90% power factor
D. 0.972 or 97% power factor
Answer C Pf = 0.9006 = 5800 watts / (230 volts x 28 amps)

60. An 120-volt electrical circuit will operate a 2400-watt resistance heater and ten 300-watt incandescent light bulbs. If the circuit is operated 10 hours each day for 300 days, how many kilowatt hours will the electrical system use during the time period? **Note: Kilowatt hours = $\frac{\text{Total Watts x Total hours}}{\text{1000 Watts/Kilowatt}}$**
A. 10,900 kilowatts hours
B. 13,700 kilowatts hours
C. 16,200 kilowatts hours
D. 19,400 kilowatts hours
Answer C. 16,200 kilowatts = [(2400 Watts + 3000 Watts) x 10 hours/day x 300 days] / 1000 Watts/kilowatt

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SECTION 4: STRUCTURAL SYSTEMS Questions 61-80

61. What is another name for metallic inert gas welding (MIG)?
A. Stick welding
B. Gas tungsten arc welding (GTAW)
C. Shielded metal arc welding (SMAW)
D. Gas metal arc welding (GMAW)
Answer D: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 533

62. What is the name of the tool used to cut internal threads?
A. Tap
B. Die
C. Drill
D. Reamer
Answer A: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 526

63. What is the most common shielding gas used for TIG welding aluminum?
A. Carbon dioxide
B. Argon
C. Nitrogen
D. Carbon dioxide/argon mix
Answer B: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 537

64. What is indicated by the two (sometimes three) digits immediately to the right of the E of shielded metal arc welding electrodes?
A. Weld position
B. Tensile strength
C. Compression strength
D. Special electrode characteristic
Answer B: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 539

65. What is the maximum safe working pressure for acetylene?
A. 15 psi
B. 20 psi
C. 25 psi
D. 30 psi
Answer A: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 541

66. What is the process by which base metals are fastened with a filler metal that melts at temperatures below 840° F?
A. Brazing
B. Braze welding
C. Soldering
D. Welding
Answer C: Mechanical Technology in Agriculture Johnson, Harper, Lawver and Buriak, Interstate Publishers, 1998, p 546

67. What type welding uses an arc surrounded by a layer of flux and is established and maintained between a continuously fed wire and the work piece?
A. Flux cored arc welding (FCAW)
B. Submerged arc welding (SAW)
C. Plasma arc welding (PAW)
D. Laser beam welding (LBW)
Answer B: Agriscience Mechanics, Phipps and Miller, Interstate Publishers, 1998, p 439

68. What is the typical arc length for a 1/8" diameter E6011 electrode used in SMAW for the flat position?
A. The electrode should touch and drag along the base metal
B. 1/32"
C. 1/8"
D. 3/8"
Answer C: Agriscience Mechanics, Phipps and Miller, Interstate Publishers, 1998, p 434

69. What device can be installed on oxy-fuel equipment to prevent a flame from traveling back up the torch/hose, past the point of installation?
A. Regulator
B. Cylinder valve
C. Flashback arrester

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D. Reverse flow check valve
Answer C (JD – Welding- FOS, p. 27)

70. What type of flame is formed when oxygen is added to a neutral flame?
A. Neutral flame
B. Oxidizing flame
C. Carburizing flame
D. Pure acetylene flame
Answer B (JD-FOS-Welding, p. 33)

71. Which of the following is the fuel gas that can be used for welding purposes?
A. MAPP
B. Propane
C. Acetylene
D. Propylene
Answer C (JD-FOS-Welding, p. 38)

72. What is the safe gas withdrawal rate for an acetylene cylinder?
A. 1/7 of the cylinders capacity per hour
B. 1/4 of the cylinders capacity per hour
C. 1/2 of the cylinders capacity per hour
D. 2/3 of the cylinders capacity per hour
Answer A (JD-FOS-Welding, p. 21)

73. What fuel gas has the highest flame temperature when burned with oxygen?
A. Acetylene
B. Natural Gas
C. MAPP Gas
D. Propylene
Answer A (JD-FOS-Welding, p. 18)

74. According the American Welding Society (AWS), what is the color code for pure tungsten electrodes (EWP) that are used with the Gas Tungsten Arc Welding process?
A. Green
B. Orange
C. Black
D. Yellow
Answer A (JD-FOS-Welding, p. 123)

75. According to the American Plywood Association, which of the following grades of veneer is the highest (best) quality?
A. Grade A
B. Grade B
C. Grade 1
D. Grade 2
Answer A (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 664- 668)

76. What is the name of a single board that supports a section of a roof on truss type building construction?
A. Girder
B. Column
C. Subfloor
D. Rafter
Answer D (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 664)

77. What is the concrete base that provides a solid, level foundation for brick, stone, or block walls?
A. Form
B. Footer
C. Control joint
D. Moisture barrier
Answer B (Agricultural Mechanics: Fundamentals and Applications, 6th ed., p. 644)

78. If 180 feet of steel rod is used to construct a hay feeding rack and the rod weighs 0.385 pounds per foot of length, what is the approximate weight of the hay feeding rack?
A. 69 pounds
B. 91 pounds
C. 155 pounds

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D. 260 pounds
Answer A: 69.3 lbs = (180 ft) x (0.385 lbs / ft)

79. Steel angle iron is sold for $2.45 per linear foot, steel rod is sold for $1.93 per linear foot, and steel pipe is sold for $2.79 per linear foot. If 18 feet of angle iron, 25 feet of rod, and 28 feet of pipe are purchased, what is the total price for the metal before taxes?
A. $ 83.75
B. $110.23
C. $138.61
D. $170.47
Answer D: $170.47 = [(18 ft) x (2.45 / ft)] + [(25 ft) x ($1.93 / ft)] + [(28 ft) x ($2.79 / ft)]

80. What is the volume, in cubic inches, of a cylinder with a diameter of 10 inches and a length of 3 feet?
Note: Volume of Cylinder = π x (radius)^2 x (length) $\pi = 3.14$ (dia./2) = radius 1 foot = 12 inches
A. 1,384 cubic inches
B. 1,826 cubic inches
C. 2,044 cubic inches
D. 2,826 cubic inches
Answer D: **2826 in^3 = Vol of Cyl. = (π) x (10"/2)^2 x (3' x 12"/1')**

SECTION 5: ENVIRONMENTAL AND NATURAL RESOURCE SYSTEMS Question 81-100

81. What is the primary purpose of the spinner located below the feed chute on a granular fertilizer spreader?
A. Force air through the hopper and aid the gravity feed process
B. To improve the uniform distribution of the granular fertilizer
C. Vary the distance that fertilizer is thrown during turns and stops
D. Mix fertilizer and water together prior to injection in the soil
Answer: B ASABE Standard: and Calibrating Granular Broadcast Spreaders

82. Which of the following statements describes effective swath width for a broadcast granular fertilizer spreader?
A. The maximum distance that fertilizer is thrown directly below the hopper of a spreader
B. The maximum distance that fertilizer is thrown behind a granular fertilizer spreader
C. The width of the application that achieves uniform deposition rates with appropriate overlap between adjacent passes
D. The width of the application that achieves maximum deposition rates without having to overlap between adjacent passes
Answer: C ASABE Standard: Calibrating Granular Broadcast Spreaders

83. Which of the following describes the benefit of conducting a spread pattern test for a granular fertilizer spreader?
A. It evaluates the uniformity of the fertilizer distributed over the effective swath width by the spreader
B. It determines the volume of the fertilizer that is distributed directly in front of the power unit towing the fertilizer spreader
C. It measures the width of a fertilizer application that also achieves the maximum soil deposition rates
D. It accounts for the number of pounds of fertilizer that are distributed beyond the spreader's effective swath width
Answer: A ASABE Standard: Calibrating Granular Broadcast Spreaders

84. Which of the following statements is correct with regard to how the spinner's rotating speed effects granular fertilizer distribution?
A. Increasing spinner speed (revolutions per minute) decreases the distance that granular fertilizer is thrown
B. Increasing spinner speed (revolutions per minute) increases the distance that granular fertilizer is thrown
C. Decreasing spinner speed (revolutions per minute) increases the flow rate of the fertilizer from the hopper
D. Decreasing spinner speed (revolutions per minute) decreases the flow rate of the fertilizer from the hopper
Answer: B ASABE Standard: Calibrating Granular Broadcast Spreaders

85. How will a 6 mile per hour wind, blowing perpendicular to the direction of travel, effect the distribution of a liquid hebicide being applied by a spray boom positioned 30 inches above the ground?
A. Increases off target fertilizer movement
B. Decreases off target fertilizer movement
C. Increases the uniform effectiveness of fertilizer application
D. Decreases the amount of fertilizer required for a application
Answer: A ASABE Standard: Calibrating Granular Broadcast Spreaders

86. Which of the following is the best option to reduce the off target movement of a liquid fertilizer being applied by a boom sprayer?
A. Reduce the height of the spray boom above the ground

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B. Use fertilizer spray nozzles that produce smaller spray droplets
C. Increase the spray pressure (pounds per square inch) being used to deliver the fertilizer
D. Increase the travel speed (miles per hour) of the fertilizer application
Answer: A ASABE Standard: Calibrating Granular Broadcast Spreaders

87. What values are used to calculate the application rate of granular applications in pounds per acre?
A. Use travel speed in miles per hour, effective swath width in feet, and delivery rate in pounds to calculate application rate
B. Use effective swath width in feet, delivery rate in pounds, and granular size in inches to calculate application rate
C. Use delivery rate in pounds, granular size in inches, and travel speed in miles per hour to calculate application rate
D. Use granular size in inches, travel speed in miles per hour, and hopper volume to calculate application rate
Answer: A ASABE Standard: Calibrating Granular Broadcast Spreaders

88. Which of the follow correctly describes the relationship between application rate (pounds per acre) and the overlap between multiple passes of a granular fertilizer spreader?
A. Less overlap between passes will increase the travel speed requirements for the application
B. Less overlap between passes will decrease the travel speed requirements for the application
C. Greater overlap between passes will increase the overall application rate
D. Greater overlap between passes will decrease the overall application rate
Answer C: ASABE Standard: Calibrating Granular Broadcast Spreaders

89. When liquid pesticide is applied with a traditional boom sprayer, if all other variables remain constant, which of the following will result in a decreased chemical application rate?
A. Reduce the travel speed of the sprayer
B. Increase the travel speed of the sprayer
C. Replace the existing nozzles with nozzles having a larger tip size
D. Increase the spray pressure at the nozzle
Answer B: Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474, p. 4-19.

90. Which of the following pesticide spray equipment components can directly control and vary the pressure developed at the sprayer nozzle and the quantity of spray delivered to the nozzles?
A. Strainer
B. Screen
C. Nozzle body
D. Pressure regulator
Answer D Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474, p. 3-9.

91. Which of the following is a true statement with respect to groundwater and liquid chemical contamination?
A. Groundwater is easily cleaned after it becomes contaminated
B. Chemicals are not transported into groundwater by leaching
C. Shallow groundwater is more susceptible to contamination than deeper groundwater
D. Contamination is more likely with clay soils than with sandy soils
Answer C Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474

92. If other variables remain constant, which of the following adjustments to spray equipment will result in the greatest increase in application rate?
A. Increase the travel speed 20 percent
B. Decrease the travel speed 20 percent
C. Increase the spray pressure 10 percent
D. Decrease the spray pressure 10 percent
Answer B: Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474

93. If other variables remain constant, which of the following adjustments to spray application equipment will have the described effect?
A. Doubling the travel speed will double the spray application rate
B. Doubling the spray pressure will double the spray application rate
C. Doubling the travel speed will reduce the application rate by one-half
D. Doubling the spray pressure will reduce the application rate by one-half
Answer C: Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474

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94. Which of the following conditions are most likely to reduce the likelihood of off target movement by liquid chemical?

A. High spray pressure, high temperature, no wind, and high humidity
B. Low spray pressure, low temperature, low wind speed, and high humidity
C. High spray pressure, low temperature, high wind speed, and low humidity
D. Low spray pressure, high temperature, high wind speed, and low humidity

Answer B: Applying Pesticides Correctly – Private Applicator Supplement, United States Environmental Protection Agency Bulletin E-2474

95. Which of the following is typically the reason why inexperienced operators apply granular fertilizer incorrectly with a pull-behind/towed spreader?

A. Improper fertilizer is applied for the crop being treated
B. Improper loading of the spreader resulting in poor operation of the hopper delivery system
C. Improper overlap distance between passes resulting in under or over application
D. Improver and/or inconsistent travel speed when operating wheel driven spreaders

Answer C

96. Which of the following statements is true with regard to granular fertilizer spreaders?

A. Two fertilizers with different densities will have the same rate of flow and distance of throw
B. Operating spreaders with low quantities of fertilizer does not influence application rate
C. Two fertilizers with different particle sizes have the same rate of flow and distance of throw
D. When a spreader with spinners is operated over sloped terrain, the fertilizer is not uniformly applied

Answer D

97. Which of the following results in feed problems from the hopper to the spinner of a fertilizer spreader?

A. Normal motion and agitation of the spreader during operation
B. Uniform granule size and density
C. Wet or damp fertilizer granules
D. Fine rather than course granular fertilizer is used

Answer C

98. Approximately how many acres are in a rectangular field measuring 1200 yards by 2360 feet?
Note: 1 acre = 43, 560 square feet 1 yard = 3 feet

A. 141 acre
B. 195 acres
C. 256 acres
D. 320 acres

Answer B: 195.041 acres = (1200 yd x 3 ft / 1 yd x 2360 ft) x (1 acre/43,560 ft)

99. What is the approximate speed, in miles per hour, of a granular pesticide spreader that travels 275 feet in 0.75 minutes? Note: 5,280 ft = 1 mile 60 minutes = 1 hour

A. 4.2 miles per hour
B. 5.0 miles per hour
C. 6.4 miles per hour
D. 8.6 miles per hour

Answer A: 4.1666 mph = (275 ft / 0.75 min) x (60 min / 1 hr) x (1 mi / 5,280 ft)

100. A pesticide label specifies that 1.5 pints of pesticide concentration, mixed with 20 gallons of water, are to be applied per acre. Approximately how many gallons of pesticide concentration are required to treat a 320-acre field?
Note: 128 ounces = 1 gal 16 ounces = 1 pint

A. 20 gallons
B. 45 gallons
C. 60 gallons
D. 85 gallons

Answer C: 60 gal = [(1.5 pts / ac) x (16 oz / pt) x (1 gal / 128 oz) x (320 acres)]

End of Examination