

**Texas Agricultural Technology & Mechanical Systems CDE**  
**Area X Qualifying Exam                      April 8, 2015**

Theme for 2015 - "Integrated Pest Management"

**Instructions:** The written exam for the ATMS CDE consists of 100 multiple-choice questions; each worth one point. You have 60 minutes to complete this portion. Select the most correct answer choice, answer the question in the proper place on the scantron, and mark completely. Please erase clearly and don't tear the scantron. **DO NOT WRITE ON THE EXAM!** Thank you & Good luck!

1. When transporting a boom sprayer on a public road or highway, always\_\_\_\_\_.
- a. use all required warning devices
  - b. use the SMV emblem
  - c. use warning lights
  - d. all of the above.

IMS #8790, Understanding & Applying Safe Work Practices to Agriculture

2. Recommended servicing of a boom sprayer includes \_\_\_\_\_.
- a. pre-season inspection
  - b. preventive maintenance during spraying season
  - c. regular maintenance and repair at the end of the spraying season
  - d. all of the above

FOS Mowers & Sprayers

3. Which type of electric conductor is appropriate for locations where both heat and moisture are concerns?
- a. THHN
  - b. THWN
  - c. TRW
  - d. TW

IMS #8602-B, Electric Wiring

4. Altitude is defined as \_\_\_\_\_.
- a. the distance the wings of a spray boom drop below a horizontal line
  - b. the height above the earth's surface
  - c. the distance the wings of a spray boom lag behind the line of forward motion
  - d. the distance between the center of the axle and the top of the tire tread.

IMS #8235-A, Understanding GIS and GPS

5. Since oil is a liquid, it can be \_\_\_\_\_.
- a. compressed
  - b. crushed
  - c. stretched
  - d. exhausted

IMS #8794, Maintaining Hydraulic Systems

6. GPS data can be stored in \_\_\_\_\_ format.

- a. duster
- b. dotcom
- c. raster
- d. skip-space

IMS #8235-A, Understanding GPS and GIS Systems

7. A position identified by latitude and longitude, stored in a GPS system, is a:

- a. datapoint
- b. hot spot
- c. location
- d. waypoint

IMS #8235-A, GPS and GIS

8. Empty pesticide containers should be:

- a. disposed of in an EPA-approved landfill
- b. stored in a locked area
- c. tripled-rinsed and drained
- d. all of the above

IMS #4320, FBM Chemical Application Management

9. While providing fingertip control to the operator, tractor hydraulics also deliver\_\_\_\_\_.

- a. increased engine horsepower
- b. greater force with minimal effort
- c. reduced purchase price
- d. lower weight-to-speed ratio.

IMS #8794, Maintaining Hydraulic Systems

10. A section of 12/3 WG NM sheathed conductor will contain:

- a. one black wire, one white wire, one bare wire
- b. one black wire, one white wire, one green wire, one bare wire
- c. one black wire, one white wire, one red wire, one bare wire
- d. two black wires one white wire, one bare wire

IMS #8602-B, Electric Wiring

11. Information regarding a specific geographic location is referred to as \_\_\_\_\_.

- a. raster data
- b. vector data
- c. real-time data
- d. spatial data

IMS #8235-A, Understanding GIS and GPS Technologies

12. Worn spray nozzles can cause \_\_\_\_\_.

- a. over-application
- b. the potential for chemical waste, crop burn, and environmental risk
- c. uneven spray patterns and inadequate spray coverage
- d. all of the above

IMS #4320, FBM Chemical Application Management

13. To extinguish an oil-based fire on a self-propelled boom-type sprayer, use a \_\_\_\_\_.  
a. type A fire extinguisher  
b. type B fire extinguisher  
c. type C fire extinguisher  
d. type D fire extinguisher

IMS #8790, Understanding & Applying Safe Work Practices to Agriculture

14. Safety alert symbols are used on boom-type sprayers to help identify hazards. The signal word is used to identify the most potentially hazardous condition is \_\_\_\_\_.  
a. Caution!  
b. Danger!  
c. Look out!  
d. Warning!

IMS #8790, Understanding & Applying Safe Work Practices to Agriculture

15. Hydraulic systems convert \_\_\_\_\_ force into mechanical force.  
a. free-running  
b. fluid  
c. steam  
d. temporary

IMS #8794, Maintaining Hydraulic Systems

16. The bolt grade with the highest SAE standard tensile strength is \_\_\_\_\_.  
a. Grade US #1  
b. Grade ISO 7  
c. Grade 5 Extra  
d. Grade 8

IMS #8617, Selecting & Using Fasteners

17. Before starting a self-propelled boom sprayer, check \_\_\_\_\_ fluid levels.  
a. coolant  
b. fuel & oil  
c. hydraulic  
d. all of the above

FOS Fuels, Coolants & Lubricants

18. To change the direction of cylinder movement in a hydraulic system, simply \_\_\_\_\_.  
a. move the control lever in the corresponding direction  
b. switch one of the fluid lines  
c. switch any two of the fluid lines  
d. switch the direction of the hydraulic pump

IMS #8794-G, Maintaining Hydraulic Systems

19. There are \_\_\_\_\_ square feet in one acre.  
a. 100  
b. 5,280  
c. 43,560  
d. 10,000

IMS #8772, Surveying Land

20. A pesticide storage site should provide for all except \_\_\_\_\_.  
 a. freedom from water damage & runoff  
 b. non-porous flooring  
 c. security  
 d. seed & feed storage

IMS #4320, FBM Chemical Application Management

21. The Society of Automotive Engineers (SAE) designates the \_\_\_\_\_.  
 a. classification of engine oils  
 b. combustion range of hydrocarbons  
 c. detergent index of engine oils  
 d. viscosity ranges of engine oils and gear lubricants.

IMS #8794-C, Selecting Lubricants and Maintaining Lubrication Systems

22. A damaged hydraulic pump relief valve may be indicated by \_\_\_\_\_.  
 a. foamy fluid  
 b. ruptured hydraulic lines  
 c. charred paint  
 d. dirty fluid

IMS #8794-G, Maintaining Hydraulic Systems

23. Identifying a point with a GPS system is not based on \_\_\_\_\_.  
 a. altitude  
 b. height of sun above horizon  
 c. latitude  
 d. longitude

8235-A, Understanding GIS & GPS

24. Assuming that all other factors are constant, if actual travel speed of a boom sprayer is slower than the speed at which the sprayer was calibrated, the application rate \_\_\_\_\_.  
 a. is not affected by travel speed if the sprayer was properly calibrated  
 b. is higher  
 c. is lower  
 d. does not change

IMS #4320, FBM Chemical Application Management

25. Neutral wires are attached to screws that are \_\_\_\_\_ in color.  
 a. green  
 b. silver  
 c. white  
 d. yellow

IMS #8602-B, Electric Wiring

26. To effectively maintain the hydraulic system, \_\_\_\_\_.
- operate at low RPM
  - fluid must be clean and of the proper grade
  - oil the belts frequently
  - tires must be properly inflated

IMS #8794-G, Maintaining Hydraulic Systems

27. Maintaining hydraulic systems does not include \_\_\_\_\_.
- changing filters
  - checking fluid levels
  - diverting hydraulic circuits
  - adding hydraulic fluid

IMS #8794-G, Maintaining Hydraulic Systems

28. ANSI-approved eye protection should be worn \_\_\_\_\_.
- when using a grinder
  - when using a hammer
  - when using a wrench
  - any time you are working in agricultural mechanics

IMS #8790, Understanding & Applying Safe Work Practices to Agriculture

29. One mile per hour is equal to \_\_\_\_\_ feet per minute.
- 88
  - 640
  - 1620
  - 5280

IMS #8792-A, Identifying & Selecting Machines and Equipment

30. You inherit a Jinxco 15' self-propelled boom sprayer valued at \$3,000. The sprayer needs approximately \$375 worth of repairs and maintenance to get ready for use, and has an annual maintenance cost of \$115. Your municipality will pay \$5 per acre to have recreational fields sprayed periodically. You must spray \_\_\_\_\_ acres over a three-year period to cover the repairs and maintenance costs.
- 144
  - 444
  - 744
  - can't be determined from information provided

IMS #8792-A, Identifying & Selecting Machines and Equipment

31. The most-commonly used color of tubing for fluid-carrying applications in hydraulic equipment is \_\_\_\_\_.
- blue
  - black
  - black and blue
  - striped

IMS #8794-G, Maintaining Hydraulic Systems

32. GIS data can be arranged and displayed in \_\_\_\_\_.  
 a. analyses  
 b. layers  
 c. levels  
 d. rasters

IMS #8235-A Understanding GIS and GPS Systems

33. Rate of flow in a hydraulic system is measured in \_\_\_\_\_.  
 a. average capacity  
 b. gallons per minute  
 c. liters  
 d. viscosity

IMS #8794-G, Maintaining Hydraulic Systems

34. An electric motor used to run a hydraulic pump should be protected with a \_\_\_\_\_.  
 a. buss fuse  
 b. double trip breaker  
 c. GFCI  
 d. magnetic relay

IMS #8795, Selecting, Operating, and Maintaining Electric Motors

35. The four general components of a GIS system are hardware, software, \_\_\_\_\_, and the end product or output.  
 a. arc functions  
 b. data  
 c. sensors  
 d. T-drives

IMS #8235-A, Understanding GIS and GPS Systems

36. The lethal probability classification of a chemical is the LD50 rating; the LD50 listed below with the highest toxicity rating is \_\_\_\_\_.  
 a. 50  
 b. 570  
 c. 5000  
 d. 7500

IMS #4320, FBM Chemical Application Management

37. An additive that prevents air bubbles from forming in hydraulic fluid is an \_\_\_\_\_ agent.  
 a. anti-foam  
 b. anti-oxidant  
 c. hydrocarbon  
 d. surfactant

IMS #8794-G, Maintaining Hydraulic Systems

38. When the control lever is moved on a hydraulic system, \_\_\_\_\_.  
 a. the spool valve moves and the hydraulic pump is engaged  
 b. the relief valve opens and the pump begins to cycle  
 c. the swash plate energizes and the pistons open, allowing the pump to run  
 d. the bypass valve opens, providing flow for the pump to run

IMS #8794-G, Maintaining Hydraulic Systems

39. The tool used to test the protection level of antifreeze - water solutions is a:
- hydrometer
  - near infrared sensor
  - photo cell
  - photo laser

FOS Fuels, Coolants, & Lubricants

40. The shape of the orifice on the spray nozzle determines \_\_\_\_\_.
- the angle of the spray pattern
  - length and width of the spray pattern
  - the shape of the spray pattern
  - all of the above

IMS #4320, FBM Chemical Application Management

41. When hydraulic equipment is lowered, fluid returns to the \_\_\_\_\_ through the other connecting hose.
- control valve
  - pump
  - reservoir
  - hydraulic fluid does not return anywhere

IMS #8794-G, Maintaining Hydraulic Systems

42. The formula for theoretical field capacity is  $\text{Speed} \times \text{Width} / 8.25$ . IF a self-propelled boom sprayer moves at 3.25 mph and covers a width of 29 feet, theoretical field capacity is \_\_\_\_\_.
- 6.5 acres/hour
  - 6.86 acres/hour
  - 7.87 acres/hour
  - 7.95 acres/hour

IMS #8792, Adjusting, Calibrating, Maintaining and Operating Equipment

43. The \_\_\_\_\_ of fluid performs the raising, lowering, and adjusting of hydraulic equipment.
- fracturing
  - blending
  - relocation
  - pressurization

IMS #8794-G, Maintaining Hydraulic Systems

44. Hydraulics is the science of \_\_\_\_\_ forces.
- air
  - fluid
  - monofilament
  - resistance-controlled

IMS #8795, Selecting, Operating, and Maintaining Electric Motors

45. Hydraulic pumps are capacity- or strength-rated in \_\_\_\_\_ of output.
- cubic centimeters of displacement
  - gpm / gallons per minute
  - rpm / revolutions per minute
  - joules / hectare

IMS #8794-G, Maintaining Hydraulic Systems

46. A one-micron (1  $\mu\text{m}$  or 1  $\text{um}$ ) pore in a filter is \_\_\_\_\_ in size.
- 1/10 of a meter
  - 1/100 of a meter
  - 1/1000 of a meter
  - 1/1,000,000 of a meter

FOS Fuels, Coolants, and Lubricants

47. When reviewing MSDS data for pesticides, LD50 data is found in the \_\_\_\_\_.
- exposure control data
  - health hazard data
  - leak control data
  - reactivity data

IMS #4320, FBM Chemical Application Management

48. Two basic types of hydraulic oil coolers are air-to-oil coolers and \_\_\_\_\_ coolers.
- controlled expansion
  - flashpoint
  - submersible
  - water-to-oil

IMS #8794-G, Maintaining Hydraulic Systems

49. GPS is an acronym for \_\_\_\_\_.
- generally permissible structures
  - global positioning systems
  - globally permitted situations
  - geochemical positioning status

IMS #8235-A, Understanding GIS and GPS Technologies

50. The proper level for filling the radiator of a self-propelled sprayer with coolant is \_\_\_\_\_.
- filled to  $\frac{1}{2}$  capacity
  - filled to  $\frac{3}{4}$  capacity
  - full to the top of the radiator
  - allow adequate room for the coolant to expand.

FOS Fuels, Coolants, & Lubricants

51. When maintaining boom sprayers, it is recommended to replace nozzles that are \_\_\_\_\_ above or below the desired application rate.
- 1%
  - 5%
  - 10%
  - 12%

IMS #4320, FBM Chemical Application Management



52. Electrical conductors are labeled to indicate gauge according to \_\_\_\_\_.  
 a. American Welding Society sizes  
 b. American Wire Gauge standards  
 c. National Electrical Code  
 d. United States Department of Weights and Measures

IMS #8602-A, Electrical Principles, Terminology, & Safety

53. GIS data is generally gathered on an x/y axis, called \_\_\_\_\_.  
 a. analytical reference points  
 b. Cartesian coordinates  
 c. digital identifiers  
 d. geometric projections

IMS #8235-A, Understanding GIS and GPS Technologies

54. A control valve on a hydraulic system \_\_\_\_\_.  
 a. disengages the rotor shaft  
 b. opens the relief valve  
 c. stops or changes the direction of flow of fluid  
 d. opens the reservoir access port

IMS #8794-G, Maintaining Hydraulic Systems

55. A / an \_\_\_\_\_-center hydraulic system allows more power to be available for other uses.  
 a. alternating  
 b. closed  
 c. graduated  
 d. open

IMS #8794-G Maintaining Hydraulic Systems

56. Three distinct components of a GPS system are the \_\_\_\_\_ segment, control segment, and user segment.  
 a. remote  
 b. line  
 c. space  
 d. universal

IMS #8235-A, Understanding GIS and GPS Technologies

57. The safest method for detecting a pinhole leak in a hydraulic system is by using \_\_\_\_\_.  
 a. a flashlight  
 b. commercial leak-detection sprays  
 c. the back of one's hand  
 d. a light-colored piece of paper

IMS #8794-G, Maintaining Hydraulic Systems

58. A boom sprayer that travels 500 feet in 48 seconds is traveling \_\_\_\_\_ MPH.  
 a. 5.2  
 b. 7.1  
 c. 8.3  
 d. 10

IMS #8201-A, Safe Operation of Agricultural Tractors and Equipment

59. The \_\_\_\_\_ rating indicates the ignition quality of diesel fuel for a self-propelled sprayer.
- cetane
  - hydrocarbon
  - octane
  - saturated hydrocarbon

IMS #8794-D, Fuel System Maintenance: Fuel Selection, Storage, and Handling

60. Boom-sprayer operators know that flow rate is proportional to pressure, or \_\_\_\_\_.
- flow rate  $\neq$  pressure
  - higher pressure = higher flow rate
  - drive faster to increase pressure
  - use linear-flow nozzles

FOS Mowers & Sprayers

61. To double flow rate in a boom sprayer, increase the pressure by a factor of \_\_\_\_\_.
- 2
  - 4
  - 8
  - 16

FOS Mowers & Sprayers

62. Application equipment that applies dry chemicals in dust or granular form uses a positive-type metering system to dispense the materials based on \_\_\_\_\_.
- direct injection
  - particle size
  - volume
  - weight

IMS #4320, FBM Chemical Application Management

63. A shaft turning a 3" pulley at 1750 rpm will operate a sprayer pump with a 2" pulley at \_\_\_\_\_ rpm.
- 820
  - 1240
  - 2630
  - 3500

IMS #8795, Selecting, Operating, and Maintaining Electric Motors

64. Common types of spray nozzles are centrifugal nozzles, \_\_\_\_\_ nozzles, two-fluid atomizers, and rotary atomizers.
- fan-type
  - flooding
  - mixing
  - reciprocating

FOS Mowers & Sprayers

65. To properly select spray nozzle tips, the operator must know the speed of the vehicle in mph (kph), gallons per acre / L/ha to be applied, \_\_\_\_\_, and combined flow of spray solution from all nozzles.
- gallons of water in solution tank
  - position of control levers
  - width of spray per nozzle tip
  - speed of agitator motor

FOS Mowers & Sprayers

66. Recalibrate your sprayer when changing ground speeds, nozzle tips, \_\_\_\_\_, or spray configurations.
- size of tank
  - chemicals
  - brands of tractors
  - shut-off valves

FOS Mowers & Sprayers

67. Variable rate technology (VRT) uses three basic components; \_\_\_\_\_ is not one of those components.
- actuators
  - controllers
  - rotators
  - sensors

FP The Precision Farming Guide for Agriculturists

68. A variable resistor used to control voltage is a \_\_\_\_\_.
- capacitor
  - interocitor
  - potentiometer
  - relay

IMS #8792-D, Identifying and Servicing Monitoring, Sensing, and Metering Devices

69. \_\_\_\_\_ is not considered to be appropriate PPE for pesticide applicators.
- aprons & headgear
  - eye protection
  - leather gloves
  - respirator

IMS #8792-E, Adjusting, Calibrating, Maintaining, and Operating Equipment

70. Pocket navigators can be programmed to use a specific \_\_\_\_\_, or model of the earth.
- apogee
  - datum
  - globe
  - perigee

IMS #8235-A, Understanding GIS and GPS Technologies

71. Using the formula  $\text{Speed} \times \text{Width} / 8.25$ , a 12' wide self propelled boom sprayer moving at 3.5 mph can theoretically spray \_\_\_\_\_ acres per hour.
- 3.75
  - 5.09
  - 6.82
  - 9.03

IMS #8792-E, Adjusting, Calibrating, Maintaining, and Operating Equipment

72. Speedometers and tachometers geared to wheels or other parts of the drive train do not accurately indicate ground speed because they do not compensate for \_\_\_\_\_.
- tire inflation
  - tire size
  - tire slippage
  - all of the above

IMS #4320, FBM Chemical Application Management

73. The formula for calculating horsepower is  $W \text{ (lbs)} \times D \text{ (ft.)} \times T \text{ (sec)}$  divided by \_\_\_\_\_.
- 10
  - 50
  - 500
  - 550

IMS #8792-E, Adjusting, Calibrating, Maintaining, and Operating Equipment

74. Moving the right arm across the neck in a throat-cutting motion is an ASAE hand signal that means \_\_\_\_\_.
- raise the spray boom approximately 5'
  - start the engine
  - stop the engine
  - stop forward travel

IMS #8790, Understanding & Applying Safe Work Practices

75. Hydraulic hoses do not offer \_\_\_\_\_ as an advantage of use.
- absorption of vibration
  - unlimited elasticity
  - ability to withstand pressure surges
  - ease of routing and connection

IMS #8794-G, Maintaining Hydraulic Systems

76. The operator's manuals of boom-type sprayers generally recommend that fuel tanks be filled at the day's end to \_\_\_\_\_.
- allow trash to settle out overnight
  - decrease moisture condensation in the tank
  - prevent trash from entering the tank
  - reduce the need for a fuel filter

IMS #8794-D, Fuel System Maintenance, Fuel Selection, Storage, and Handling

77. Each NAVSTAR satellite employs \_\_\_\_\_ onboard atomic clocks to ensure accuracy.
- 2
  - 4
  - 6
  - 8

IMS #8325-A, Understanding GIS and GPS Technologies

78. Hydraulic fluid must be clean and of the \_\_\_\_\_ for the hydraulic system to function properly.
- correct temperature
  - correct thickness
  - proper grade
  - proper brand

IMS #8794-G, Maintaining Hydraulic Systems

79. A common error that affects the accuracy of a GPS system is \_\_\_\_\_ error..
- digital
  - magnetic
  - multipath
  - operator

IMS #8235-A, Understanding GIS and GPS Technologies

80. GPS technology depends on a logic model to reject the obvious \_\_\_\_\_ location.
- altitude
  - elevated
  - mid-point
  - wrong

IMS #8235-A, Understanding GIS and GPS Technologies

81. Material Safety Data Sheets (MSDS) provide pesticide-specific details on all factors except \_\_\_\_\_.
- emergency response techniques
  - mixing instructions
  - physical & health hazards
  - safety procedures

IMS #4320, FBM Chemical Application Management

82. Contamination of hydraulic fluid is an equipment maintenance problem; \_\_\_\_\_ occurs when hydrocarbons in fluid combine with oxygen in the air to produce organic acids.
- aliphaticization
  - carbonization
  - corrosion
  - oxidation

IMS #8794-C, Selecting Lubricants and Maintaining Lubrication Systems

83. Induced random error in the GPS system is called \_\_\_\_\_.  
 a. IRE  
 b. technology hiccup  
 c. selective availability  
 d. fused signals

IMS #8235-A, Understanding GIS and GPS Technologies

84. When spray system pressure increases, droplet size at nozzle orifice \_\_\_\_\_ as the rate of orifice wear increases.  
 a. decreases  
 b. increases  
 c. increases proportionally with the amount of chemical in the mixture.  
 d. remains the same

IMS #4320, FBM Chemical Application Management

85. Remote sensing identifies \_\_\_\_\_ without actually being in physical contact with them.  
 a. elevations  
 b. objects  
 c. textures  
 d. none of the above

IMS #8235-A, Understanding GIS and GPS Technologies

86. A drive belt that rides deep in the pulley groove \_\_\_\_\_.  
 a. should be replaced  
 b. is a type AA belt  
 c. is a type BTP belt  
 d. tells you to loosen the space between the pulleys

FOS Belts & Chains

87. Noisy, whining hydraulic pumps are not generally caused by \_\_\_\_\_.  
 a. clogged filters  
 b. low fluid levels  
 c. improper fluid  
 d. overloads

IMS #8794-G, Maintaining Hydraulic Systems

88. Remote cylinders convert fluid force to \_\_\_\_\_ force.  
 a. dynamic  
 b. mechanical  
 c. static  
 d. virtual

IMS #8794-G, Maintaining Hydraulic Systems

89. Hydraulic lines are simpler and more direct than \_\_\_\_\_ linkages.  
 a. alternate  
 b. mechanical  
 c. virtual  
 d. pneumatic

IMS #8794-G, Maintaining Hydraulic Systems

90. A boom sprayer that travels 400 feet in 54 seconds is traveling \_\_\_\_\_ MPH.
- 4
  - 5
  - 6
  - 7

IMS #8201-A, Safe Operation of Agricultural Tractors and Equipment

91. \_\_\_\_\_ is not a source of unavoidable error in the GPS system.
- distance
  - gravity
  - humidity
  - magnetism

IMS #8235-A, Understanding GIS and GPS Technologies

92. You plan to apply 3 pints of pesticide per acre in 11 gallons of spray. How much pesticide must be added to a 300 gallon tank?
- 10.22 gallons
  - 11.25 gallons
  - 30.35 gallons
  - 40.50 gallons

IMS #4320, FBM Chemical Application Management

93. A quarter-section of land contains \_\_\_\_\_ acres.
- 160
  - 640
  - 1000
  - 5280

IMS #8772, Surveying Land

94. A rule for determining ballast requirements for mounted boom sprayers is \_\_\_\_\_.
- 1/3 of weight on front, 2/3 weight on rear
  - 1/2 of weight on front, 1/2 weight on rear
  - 2/3 weight on front, 1/3 on rear
  - 3/4 weight on front, 1/4 on rear

FMO Tractors

95. When calibrating chemical application equipment, the first step is to determine the \_\_\_\_\_ of the equipment during application.
- bulk tank capacity
  - cost/benefit ratio
  - field speed
  - wind speed and direction

IMS #4320, FBM Chemical Application Management

96. The Department of Defense (DOD) monitors satellite orbits to reduce \_\_\_\_\_ error.
- atypical
  - commercial
  - orbital
  - piezoelectric

IMS #8235-A, Understanding GIS and GPS Technologies

97. The Department of Defense (DOD) monitors atomic clocks to reduce \_\_\_\_\_ error.
- fractional
  - minute
  - secondary
  - timing

IMS #8235-A, Understanding GIS and GPS Technologies

98. The appropriate control valves for hydraulic systems are operated by \_\_\_\_\_.
- foot pedals
  - levers
  - switches
  - toggles

IMS #8794-G, Maintaining Hydraulic Systems

99. A / an \_\_\_\_\_ pump is not a common arrangement for a hydraulic pump.
- cylindrical
  - impeller
  - rotor
  - swaged

IMS #8794-G, Maintaining Hydraulic Systems

100. Variable rate application (VRA) actuators use \_\_\_\_\_ or servo valves to change rates.
- sensors
  - foam markers
  - switches
  - solenoids

IMS #8235-A, Understanding GIS and GPS Technologies