

**2016 Wyoming State Agricultural Mechanics  
Career Development Event: Animal Production Systems**

You will have 60 minutes to complete this examination. Answer the multiple-choice questions by selecting the one best answer for each question and bubbling in the answer on the provided scantron.

**SECTION 1: Machinery & Equipment Systems Questions 1-10**

1. \_\_\_\_\_ **Cone-shaped large round bales result from which of the following conditions?**
  - a. Feeding too much hay into one side of the baler
  - b. Too much hay going into the middle of the baler
  - c. Windrows that are too small
  - d. Windrows that are too far apart
  
2. \_\_\_\_\_ **When purchasing a tractor, the salesperson describes the power as the amount of weight the unit can pull at a given speed. What kind of power is being described by the sales person?**
  - a. Engine power
  - b. Drawbar power
  - c. Power takeoff power
  - d. Hydraulic power
  
3. \_\_\_\_\_ **When hay is baled, it should not be higher than \_\_\_\_\_ moisture. At \_\_\_\_\_ levels of moisture, bales lose large amounts of dry matter caused by excessive heating and molding**
  - a. 28 to 32 percent; higher
  - b. 12 to 16 percent; lower
  - c. 18 to 22 percent; higher
  - d. 34 to 40 percent; lower
  
4. \_\_\_\_\_ **Which of the following types of hay conditioners uses a row of fast spinning tines to condition hay?**
  - a. Crimper
  - b. Crusher
  - c. Dehydrator
  - d. Impeller

5. \_\_\_\_\_ **Heating occurs to some extent in all forage material unless it contains less than \_\_\_\_\_ moisture.**
- a. 15 percent
  - b. 20 percent
  - c. 25 percent
  - d. 30 percent
6. \_\_\_\_\_ **A diesel engine produces blue-colored exhaust. What is the most likely cause?**
- a. Low engine temperature
  - b. Combustion of engine oil
  - c. Restricted air intake
  - d. Turbocharger failure
7. \_\_\_\_\_ **A diesel engine produces white-colored exhaust. What is the most likely cause?**
- a. Low engine temperature
  - b. Combustion of engine oil
  - c. Restricted air intake
  - d. Turbocharger failure
8. \_\_\_\_\_ **The average farm tractor will convert about what percentage of PTO (power take-off) power to drawbar power?**
- a. 40 percent
  - b. 55 percent
  - c. 86 percent
  - d. 100 percent
9. \_\_\_\_\_ **The theoretical field capacity of a machine such as a disk harrow or chisel plow is a function of what two factors?**
- a. Tillage depth and working width
  - b. Travel speed and working width
  - c. Tractor power output and draft load
  - d. Machine rating and velocity

10. \_\_\_\_\_ **The extent of temperature rise and duration of heat production in hay depends on moisture content. A relative humidity of 90 to 100 percent, which favors mold development, can develop in \_\_\_\_\_ moisture hay that is stored inside.**
- a. 5 percent
  - b. 10 percent
  - c. 15 percent
  - d. **20 percent**

**Section 2: Electrical Systems Questions 11 – 20**

11. \_\_\_\_\_ A simple device that opens and closes an electrical unit is called a(an):
- a. Volt
  - b. Discharge
  - c. **Switch**
  - d. Ampere
12. \_\_\_\_\_ **What is the unit of measure of electrical pressure that relates to current flow through a given resistance?**
- a. Ohmage
  - b. Amperage
  - c. **Voltage**
  - d. Wattage
13. \_\_\_\_\_ **The unit used for measuring electrical current is called a(an):**
- a. Electrode
  - b. Volt
  - c. Discharge
  - d. **Ampere**
14. \_\_\_\_\_ **The material that electricity can travel through easily is called a**
- a. Electrical field
  - b. **Conductor**
  - c. Element
  - d. Fixed Resistor

15. \_\_\_\_\_ **Which of the following is the proper name for the electrical conductors that travel from the power company's transformer to a residence?**
- a. **Service drop**
  - b. Distribution drop
  - c. Meter drop
  - d. Transmission drop
16. \_\_\_\_\_ **The continuous load supplied by a circuit should not exceed 80% of the branch circuit rating. After how many hours of continuous operation is a load considered to be a continuous load?**
- a. One-half hour
  - b. One hour
  - c. Two hours
  - d. **Three hours**
17. \_\_\_\_\_ **A circuit is a path taken by a current. A path with no breaks is called a**
- a. Complete circuit
  - b. **Closed circuit**
  - c. Current circuit
  - d. Grounded circuit
18. \_\_\_\_\_ **A GFCI is required in all but one of these locations:**
- a. Outlets 1-2 feet off the floor in a garage
  - b. **Outlets on the ceiling in a garage**
  - c. Near the kitchen sink
  - d. Near the bathroom sink
19. \_\_\_\_\_ **If there is a break in the path the current follows, the circuit is incomplete. A break in the path is called an**
- a. Isolated circuit
  - b. Full circuit
  - c. Incomplete circuit
  - d. **Open circuit**

20. \_\_\_\_\_ **The smallest gage of copper wire the National Electrical Code allows for house wiring is:**
- a. #4
  - b. #12
  - c. #6
  - d. #14

**Section 3: Energy Systems Questions 21 – 30**

21. \_\_\_\_\_ **The bottom ring on the piston is called the:**
- a. Keystone ring
  - b. Compression ring
  - c. Oil ring
  - d. Centering ring
22. \_\_\_\_\_ **In small diesel engines \_\_\_\_\_ is taken in during the intake stroke.**
- a. Air only
  - b. Fuel only
  - c. Air and fuel
  - d. Fuel and water
23. \_\_\_\_\_ **How many revolutions of the crank shaft are in a complete cycle for a 4-stroke-cycle engine?**
- a. 1
  - b. 2
  - c. 3
  - d. 4
24. \_\_\_\_\_ **When the piston of the four stroke small engine reaches the bottom of the cylinder on the intake stroke it starts upward on what stroke?**
- a. Exhaust
  - b. Combustion
  - c. Compression
  - d. Power

25. \_\_\_\_\_ **How many revolutions of the crank shaft are in a complete cycle for a 2-stroke-cycle engine?**
- a. 1
  - b. 2
  - c. 3
  - d. 4
26. \_\_\_\_\_ **In the electronic ignition the spark originates from the:**
- a. Points
  - b. Battery
  - c. Condenser
  - d. Flywheel magnets
27. \_\_\_\_\_ **Three key differences between the diesel and the gasoline 4-stroke-cycle engines are: Diesel is heavier construction, Diesel has a higher compression ratio, and \_\_\_\_\_**
- a. Diesel always uses a carburetor
  - b. Diesel combustion occurs because of intense heat and pressure added to the fuel and air
  - c. Gasoline combustion requires a fuel injector to create the spark
  - d. Diesel engines have oversized spark plugs
28. \_\_\_\_\_ **Modern small engines use a solid-state ignition system to open and close the primary circuit. What part of the small engine ignition system opened and closed the primary circuit prior to the solid-state system?**
- a. Transistors
  - b. Breaker Points
  - c. Integrated chips
  - d. Coil
29. \_\_\_\_\_ **What is the part of the coil that is made of several thousand turns of fine gage wire?**
- a. The secondary circuit
  - b. The main circuit
  - c. The primary circuit
  - d. The complete circuit

30. \_\_\_\_\_ **The intake valve of a 4-stroke single-cylinder small engine is opened and closed by the action of what component?**
- a. Piston
  - b. Throttle
  - c. Wrist pin
  - d. **Camshaft**

**Section 4: Structural Systems Questions 31 – 40**

31. \_\_\_\_\_ **While flame cutting, the preheat flames (with the cutting jets open) should be?**
- a. Carborizing
  - b. Oxidizing
  - c. **Neutral**
  - d. Reducing
32. \_\_\_\_\_ **What is the maximum hose pressure in pounds per square inch (psi) for acetylene fuel gas used in oxyacetylene cutting equipment?**
- a. 5 psi
  - b. **15 psi**
  - c. 45 psi
  - d. 90 psi
33. \_\_\_\_\_ **What is the term for the width of the cut produced by any cutting process?**
- a. Dragline
  - b. Scarf
  - c. **Kerf**
  - d. Slag
34. \_\_\_\_\_ **What is the recommended eye protection shade number for a welding helmet lens used when welding with 1/8 inch electrodes?**
- a. No. 4 lens shade
  - b. No. 6 lens shade
  - c. No. 8 lens shade
  - d. **No. 10 lens shade**

35. \_\_\_\_\_ **Which oxyacetylene flame has an excess of fuel?**
- a. Oxidizing
  - b. **Carburizing**
  - c. Neutral
  - d. None of the above
36. \_\_\_\_\_ **Vaporized metals such as zinc, cadmium, lead, chromium and beryllium**
- a. **Are classified as hazardous**
  - b. Are explosive
  - c. Are highly flammable
  - d. May cause slag inclusions
37. \_\_\_\_\_ **What is the length of the most commonly used electrode for the process of shielded metal arc welding?**
- a. 8 inches
  - b. 10 inches
  - c. **14 inches**
  - d. 18 inches
38. \_\_\_\_\_ **Ductility is the ability of a metal to do what before it breaks?**
- a. Resist penetration
  - b. Return to its original shape after stretching
  - c. **Elongate**
  - d. Harden
39. \_\_\_\_\_ **What welding agency or entity does the acronym AWS identify?**
- a. Alternative Welding System
  - b. Associated Welding Stores
  - c. Arc Welding System
  - d. **American Welding Society**

40. \_\_\_\_\_ **Federal regulation requires that hazardous information about a product be provided to all users of that product. The form used to provide this information is called a(n)**
- a. Information Form (IF)
  - b. Hazardous Information Sheet (HIS)
  - c. Occupational Safety and Hazard Form (OSHF)
  - d. **Material Safety Data Sheet (MSDS)**

**Section 5: Environmental and Natural Resource Systems Questions 41 – 50**

41. \_\_\_\_\_ **A manure slurry is more viscous than liquid manure because it contains a higher percentage of what component?**
- a. Hydrogen
  - b. Water
  - c. **Solids**
  - d. Phosphorus
42. \_\_\_\_\_ **Which of the following types of energy describes electrical, radiant, thermal, motion and sound?**
- a. **Kinetic**
  - b. Potential
  - c. Mechanical
  - d. Chemical
43. \_\_\_\_\_ **What are two sources of water that increase the amount of liquid manure that must be dealt with at a livestock facility?**
- a. High humidity and irrigation water
  - b. Low humidity and irrigation water
  - c. **Wash water and rain water runoff**
  - d. Underground water lines and water wells
44. \_\_\_\_\_ **Species that are not native and tend to outcompete native species for resources are described as:**
- a. **Invasive**
  - b. Predatory
  - c. Complementary
  - d. Indigenous

45. \_\_\_\_\_ **What type of bacteria does not require the presence of free or dissolved oxygen for metabolism?**
- a. **Anaerobic**
  - b. Aerobic
  - c. Dehydrated
  - d. Consolidated
46. \_\_\_\_\_ **In a farming situation, freshly collected manure was found to be 30 percent solids and 70 percent moisture by weight. The collected manure was stockpiled in a covered structure for several months and during that time 30 percent of the manure's original moisture content evaporated and/or drained away. If 6 tons of the drier manure is applied to crop fields, what approximate weight (in pounds) of the applied manure is actually solid?**  
**Note: 1 ton = 2000 pounds**
- a. 1,445 pounds
  - b. **4,557 pounds**
  - c. 7,889 pounds
  - d. 10,089 pounds
47. \_\_\_\_\_ **Stress cracks in grain corn kernels can be caused when high temperature grain drying is followed by which process?**
- a. Slow heating of the dried grain
  - b. **Rapid cooling of the dried grain**
  - c. Waterification of the dried grain
  - d. Rapid heating of the dried grain
48. \_\_\_\_\_ **What method of controlling invasive trees is expensive but allows for selective removal of trees?**
- a. Biological
  - b. Chemical
  - c. **Mechanical**
  - d. Physical
49. \_\_\_\_\_ **Which of the following are two types of fans that used to force air through grain in a grain bin?**
- a. **Centrifugal and axial**
  - b. Turbine and axial
  - c. Tubular and elastic
  - d. Static and dielectric

50. \_\_\_\_\_ **Which common range site has coarse textured soil that absorbs water well?**

- a. **Deep Sand**
- b. Rough Breaks
- c. Bottomland
- d. Claypan Prairie