

2015 Wyoming State Agricultural Mechanics  
Career Development Event: Integrated Pest Management

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. What is not a purpose of oil?
  - a. Cool
  - b. Clean
  - c. Seal
  - d. Cause carbon buildup
  
2. The spray pattern of a field sprayer is best adjusted by:
  - a. Increasing pressure
  - b. Decreasing pressure
  - c. Using nozzle tips with different orifices
  - d. Changing boom length
  
3. The greatest cause of wear in a hydraulic system is:
  - a. Moisture
  - b. Dirt
  - c. Rust
  - d. None of the above
  
4. A 1000 RPM power take off shaft comes from the factory with how many splines?
  - a. 14
  - b. 21
  - c. 7
  - d. 6
  
5. What should be the first thing that is done every day before using a tractor or combine?
  - a. Start it up and let it warm-up
  - b. Check the fluid levels
  - c. Read through the operator's manual
  - d. Nothing should be done before one uses it
  
6. On every piece of equipment, what is the first thing that one should do if it breaks down?
  - a. Turn off the power supply
  - b. Run after the tools
  - c. See what is broken
  - d. Call someone to fix it

7. A power take off shaft that has 6 splines rotates at how many RPM?
  - a. 520
  - b. 540
  - c. 1000
  - d. None of the above
  
8. All of the following materials are used to manufacture spray nozzles except?
  - a. Brass
  - b. Copper
  - c. Ceramic
  - d. Hardened Stainless Steel
  
9. The function of a governor is:
  - a. Limit low speed idle
  - b. Maintain a constant engine speed under varying load conditions
  - c. Regulate electrical voltage
  - d. None of the above
  
10. Good performance by the engine depends on which of the following:
  - a. Adequate supply of clean air and fuel
  - b. Good compression
  - c. Proper valve and ignition timing
  - d. All of the above

SECTION 2: Electrical Systems

Questions 11 – 20

11. Multiwire branch circuit shall
  - a. Supply only line to neutral loads
  - b. Have a disconnect to open both “hots” at the same time when supplying a device or equipment on the same yoke in a dwelling unit
  - c. Have its conductors originate from the same panelboard
  - d. All of the above
  
12. The minimum size branch circuit conductor is
  - a. No. 14
  - b. No. 12
  - c. No. 10
  - d. None of the above
  
13. Ground rods cannot be less than \_\_\_\_\_ feet in length.
  - a. 10
  - b. 8
  - c. 6
  - d. 12

14. When installing electrical cable in a wet location, which of these type cables is permitted for this type of installation?
- Type NM Romex
  - Type AC
  - Type UF
  - Type THHN
15. When installing electrical circuits, which of the following would not help reduce voltage drop?
- Decrease the length of the circuit
  - Increase the size of the conductor
  - Decrease the load of the circuit
  - Decrease the voltage of the circuit
16. The smallest size copper conductor that should be used for a 30 amp circuit is
- 14 AWG
  - 12 AWG
  - 10 AWG
  - 8 AWG
17. White wires used as a undergrounded conductor must be
- Connected to black wires
  - Connected to fixtures
  - Stripped of all insulation
  - Taped or painted black
18. The line from the power supplier's transformer to your electric meter is known as the
- Service drop
  - Distribution panel
  - Metering circuit
  - Feeder circuit
19. A four-way switch is used with two \_\_\_\_\_ switches where lights are to be controlled from three different locations.
- Four-way
  - One-way
  - Three-way
  - Two-way

20. If using metallic device boxes, the NEC requires that the cable be secured within the box by an approved \_\_\_\_\_ clamp or cable connector.
- Pigtail
  - Cable
  - Screw
  - Splice

SECTION 3: Energy Systems

Questions 21 – 30

21. On a front wheel assist tractor, what is the common percent at which the front wheels pull compared to the rear?
- 5% faster in front
  - 5% slower in front
  - 10% faster in front
  - 3% slower in front
22. Which of these regulate the speed of the engine and was invented by James Watt?
- Starter
  - Carburetor
  - Cam shaft
  - Governor
23. Black smoke from a diesel engine is an indication of what?
- More power
  - Internal coolant leak
  - Raw unburned fuel
  - All of these are correct
24. A farmer complains of low engine power in the field. What is a possible cause?
- Plugged fuel filter
  - Plugged air filter
  - Plugged A/C condenser
  - Both a and b
25. These two 12 volt batteries are hooked parallel. How much voltage is at the starter?
- Square root of 225
  - 24 volts
  - 12 volts
  - The product of  $12 * 12$
26. What does MFWD stand for?
- Manual front wheel drive
  - Mechanical front wheel drive
  - Makes foam while driving
  - Manual fold winged disk

27. A 10 horsepower single cylinder engine is operating at 5000 feet above sea level. What approximate horsepower is produced by the engine if the engine's power is decreased 2.5 percent for each 1000 feet of elevation above sea level?
- 6.65 horsepower
  - 7.52 horsepower
  - 8.75 horsepower
  - 9.62 horsepower
28. A tractor fueled by No. 2 diesel consumes 7.75 gallons per hour. When the same tractor is fueled with B20 biodiesel it consumes 8.25 gallons per hour. Approximately how many more gallons of fuel will the tractor consume during eight hours of operation if it is fueled by B20 biodiesel rather than No. 2 diesel?
- 3.0 gallons
  - .5 gallons
  - 4.0 gallons
  - 4.5 gallons
29. Which one of the following lever colors is used to signify the PTO and auxiliary power?
- Green
  - Yellow
  - Red
  - Black
30. In Wyoming, diesel fuel used for the farm is non-taxable. There is an additive added to farm fuel so it is visually seen as tax exempt. What is the additive?
- Blue dye
  - Green dye
  - Red dye
  - Orange dye

SECTION 4: Structural Systems

Questions 31 – 40

31. Free acetylene should not be stored above what PSI?
- 5
  - 15
  - 75
  - 50
32. If the flame consists of a slight excess of acetylene it is known as:
- Neutral flame
  - Oxidizing flame
  - Carburizing flame
  - None of the above

33. Which of the following are characteristics of a dirty tip?
- a. Sprigs in the flame
  - b. Frequent backfire
  - c. Hissing flame
  - d. All of the above
34. What color is the oxygen hose?
- a. Yellow
  - b. Blue
  - c. Green
  - d. Red
35. Because of its ability to dissipate heat rapidly, what are most welding tips made out of?
- a. Brass
  - b. Copper
  - c. Aluminum
  - d. Steel
36. What does MIG stand for?
- a. Manage Intense Gase
  - b. Mild Inert Gas
  - c. Metal Inert Gas
  - d. Metallic Intense Gas
37. What duty cycle rating is required for a welding machine that will operate at its maximum rating for eight minutes continually during a ten-minute period?
- a. 20%
  - b. 40%
  - c. 60%
  - d. 80%
38. Which of the following is a “low hydrogen” electrode?
- a. E6010
  - b. E6013
  - c. E7014
  - d. E7018

39. The first pass when welding multiple passes on heavy steel is called:
- a. Cap
  - b. Root
  - c. Initial
  - d. None of the above
40. Which shielding gas allows the greatest penetration when MIG welding?
- a. Carbon Dioxide
  - b. Argon
  - c. Helium
  - d. Acetylene

SECTION 5: Environmental and Natural Resource Systems

Questions 41 – 50

41. Soil compaction is the
- a. physical consolidation of the soil by an applied force that destroys structure and reduces porosity
  - b. ability for water to penetrate the pores in the soil
  - c. the force that makes the soil stick together
  - d. the amount of salt in a soil.
42. \_\_\_\_\_ is a term used to describe the level of soil acidity.
- a. sA
  - b. pH
  - c. HCl
  - d. None of the above
43. Points J and K are 700 feet apart. The difference in elevation between J and K is 28 feet. The average slope between J and K is:
- a. 2%
  - b. 3%
  - c. 4%
  - d. 6%
44. On a contour map, contour lines getting closer together indicate that:
- a. Slope is increasing
  - b. Slope is decreasing
  - c. Slope is not affected by distance between contour lines
  - d. Terrain is rocky

45. You are designing a pond for watering your 50 beef calves, which use 15 gallons per day per animal. Your design should hold enough water for one full year. How many gallons should the consumptive use volume of your pond be?
- 750 gallons
  - 5,475 gallons
  - 273,750 gallons
  - 262,500 gallons
46. When using the universal soil-loss equation  $A=RKLSCP$ , the “L” stands for:
- Rainfall
  - Soil erodibility
  - Slope length
  - Slope gradient
47. The logging company can harvest 78% of the population, and 6% of the harvest must be left as ground litter for erosion control. If the total tree population is 1500, how many trees must be left as ground litter?
- 60
  - 70
  - 80
  - 90
48. The reclaiming company must replant the top soil after removing available mineral. There are 242,000 square feet of soil to replant, and you can plant 2,420 square feet per bag of seed. How many bags of seed are required?
- 90
  - 100
  - 110
  - 120
49. Point A is 12 rods away from Point B. What is this distance?
- 12 feet
  - 198 feet
  - 120 feet
  - 240 feet

50. How many acres are covered by a piece of land 5280 feet by 2640 feet?

- a. 640 acres
- b. .5 acres
- c. 150 acres
- d. 320 acres