

**University of Wyoming
2015 Cowboy Classic**

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.	__A__	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.	__B__	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.	__B__	Which of the following implements is used to fluff up and spread out forage for faster drying?
		a. Parallel-bar rake
		b. Tedder
		c. Windrower
		d. Finger wheel rake
4.	__D__	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.	<u> B </u>	Which of the following types of large round balers produce bales with a low density inner core?	
		a.	Variable chamber
		b.	Fixed chamber
		c.	Belt-type
		d.	Chain-type
6.	<u> B </u>	A _____ is designed into most hydraulic systems to prevent damage due to excessive pressure.	
		a.	Directional control valve
		b.	Relief valve
		c.	Lift control valve
		d.	Flow control valve
7.	<u> C </u>	Determine the FHP (Fluid Horsepower) of a hydraulic pump when it is pumping 60 gal/min at 1000 psi. Formula $hp = PQ/1714$	
		a.	114
		b.	25.71
		c.	35.00
		d.	17.50
8.	<u> C </u>	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.	<u> B </u>	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.	__A__	What is the name of the device used to measure tractor PTO (power take-off) horsepower?
		a. Dynamometer
		b. Load cell
		c. Wattmeter
		d. Calorimeter

Section 2: Electrical Systems Questions 11 – 20

11.	__C__	When selecting conductor size, the smaller the AWG number, the:
		a. Smaller the current carrying capacity
		b. Smaller the cross sectional area
		c. Larger the current carrying capacity
		d. Thinner the insulation

12.	__C__	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.	__A__	The National Electric Code (NEC) requires that conductor insulation be color-coded. Which of the following conductor insulation colors indicates the grounded conductor?
		a. Green
		b. Black
		c. White
		d. Red

14.	__C__	What type of switches must a four-way switch be used in combination with in order to independently control lights from three different locations?
		a. Two four-way switches
		b. Three single-pole switches
		c. Two three-way switches
		d. Three rotary switches

15.	<u> A </u>	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.	<u> D </u>	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.	<u> A </u>	The force that causes electrons to flow in a circuit.	
		a.	Watts
		b.	Amperage
		c.	Current
		d.	Voltage
18.	<u> B </u>	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.	<u> B </u>	Wire diameter, exclusive of insulation, is generally expressed using:	
		a.	Tenth of an inch
		b.	Metal gauge
		c.	Standard Wire Gage
		d.	American Wire Gage
20.	<u> D </u>	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.	C	The bottom ring on the piston is called the:	
		a.	Keystone ring
		b.	Compression ring
		c.	Oil ring
		d.	Centering ring
22.	__A__	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.	__A__	The _____ is an engine part that opens and closes the valves in sync with the cycles of the engine.	
		a.	Camshaft
		b.	Connecting rod
		c.	Crankshaft
		d.	Flywheel
24.	__C__	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.	__C__	The spark plug is fired by secondary voltage from the:	
		a.	Coil
		b.	Points
		c.	Battery
		d.	Flywheel magnets

26.	<u> D </u>	In the electronic ignition the spark originates from the:	
		a.	Points
		b.	Battery
		c.	Condenser
		d.	Flywheel magnets
27.	<u> A </u>	The most common method of increasing valve clearance on a small, air-cooled engine is to:	
		a.	Grind the valve stem end
		b.	Knurl the valve guide
		c.	Grind the valve face
		d.	Ream the valve guide
28.	<u> B </u>	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.	<u> A </u>	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.	<u> D </u>	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.	<u> c </u>	Which of the following terms is used to describe the continuous running time for which a welder was designed?	
		a.	Duty rating
		b.	Running specification
		c.	Duty cycle
		d.	Ambient cycle
32.	<u> B </u>	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.	<u> C </u>	Which of the following shielded metal arc welding electrodes is designated as a low hydrogen electrode?	
		a.	E6010
		b.	E6011
		c.	E7018
		d.	E7024
34.	<u> D </u>	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.	<u> B </u>	National Electrical Manufacturers Association (NEMA) has classified electric arc welders primarily by duty cycle. What is the minimum duty cycle rating of a NEMA Class I machine?	
		a.	30%
		b.	60%
		c.	90%
		d.	120%

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

41.	<u> C </u>	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.	<u> A </u>	As a general rule, the _____ type of spray nozzle is most preferred for broadcast application of contact herbicides, for an even uniform spray pattern.
		a. Flat fan
		b. Hollow cone
		c. Solid cone
		d. Flood type
43.	<u> C </u>	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.	<u> D </u>	What occurs when water infiltrates the soil and removes nutrients?
		a. Fusion
		b. Percolation
		c. Gravitational water
		d. Leaching
45.	<u> A </u>	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.	<u> A </u>	Which of the following is not a positive displacement pump?	
		a.	Centrifugal
		b.	Roller
		c.	Piston
		d.	Diaphragm
47.	<u> B </u>	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.	<u> D </u>	What determines the temperature to which seed grain should be dried?	
		a.	Differs significantly between seed types
		b.	Depends directly on the relative humidity of the ambient (outside) air
		c.	For maximum seed viability the temperature is relatively high 400 F
		d.	For maximum seed viability the temperature is relatively low such as 100 F
49.	<u> A </u>	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.	<u> D </u>	What characteristic is the most useful for evaluating a fan used to dry grain while stored in a bin?	
		a.	Gallons per minute (gpm)
		b.	Pounds per square inch (psi)
		c.	Bushels per hour per kiloWatt (bph/kW)
		d.	Cubic feet per minute per bushel (cfm/bu)