

2020 Reno County Ag Challenge of Champions

Wednesday, July 22, 2020

Name _____ Age _____

4-H Club/FFA Chapter _____

RULES:

1. A county extension agent or FFA instructor must certify each contestant as a Reno county student.
2. The superintendent and committee of the contest shall be in charge of the contest. They shall have the authority for interpretation of the rules.
3. No contestants will be allowed to have books or notes during the contest.
4. While the contest is in session, there shall be no communication between contestants.

GOOD LUCK!!!

2020 Ag Challenge of Champions Written Test

Multiple Choice: (Circle the letter of the correct answer)

Agricultural/Livestock Industry

- Diseases caused by a virus or bacteria are classed as:
 - physiological
 - morphological
 - nutritional
 - pathogenic**
- Cattle can generally lose from 1 to 5 percent of their weight when transported. This is referred to as:
 - sale weight
 - shipping weight
 - shrinkage**
 - fillback
- The reflex and response that an animal has at birth is:
 - instinct**
 - conditioning
 - intelligence
 - reasoning
- The leg and loin of a lamb are the primary wholesale cuts that come from the:
 - hindsaddle**
 - rack
 - foresaddle
 - chuck
- The swine trait having the highest heritability estimate is:
 - backfat thickness
 - carcass length**
 - birth weight
 - growth rate
- Which of the following is a water-soluble vitamin?
 - potassium
 - panthothenic acid**
 - vitamin A
 - selenium
- Swine are typically identified for registration by the use of:
 - ear tags
 - freeze brand
 - ear notches**
 - tattoos

8. Scrapie is a disease of both sheep and goats that affects the:
- brain**
 - digestive tract
 - skin
 - lungs
9. Which classification of sheep are primarily bred for meat production?
- fine wool
 - medium wool**
 - long wool
 - crossbred wool
10. The release of the egg from the ovary is called:
- fertilization
 - ovulation**
 - parturition
 - reproduction
11. A visual evaluation of the amount of muscle on a hog is best seen by looking at which view of the hog?
- side
 - rear**
 - front
 - top
12. When chromosome pairs are divided in such a manner that each gamete has one of each type of chromosome, the process is called:
- meiosis**
 - mitosis
 - sequencing
 - cell division
13. The method of marketing where cattle are sold by public bidding to the highest bidder is:
- public stockyards
 - contract sales
 - auction markets**
 - terminal markets
14. The process of taking food nutrients through the intestinal wall is:
- regurgitation
 - mastication
 - absorption**
 - assimilation
15. Which production trait in swine is **NOT** increased when crossing with a purebred sow?
- feed/gain ratio
 - days to 250 pounds
 - conception rate**
 - litter size weaned

16. Angus and Hereford cattle originated from the species:

- a. **Bos taurus**
- b. Bos indicus
- c. Bull durham
- d. Tarentaise

17. The length of the estrous cycle for a ewe is:

- a. 72 hours
- b. 21 days
- c. 14 days
- d. **17 days**

18. The testes produce sperm cells and the male sex hormone:

- a. estrogen
- b. **testosterone**
- c. infundibulum
- d. progesterone

19. What feedstuff contributes most of the carbohydrates in swine rations?

- a. oats
- b. soybean meal
- c. alfalfa meal
- d. **corn**

20. According to USDA, the greatest expense in the production of livestock is:

- a. contract and hired labor
- b. livestock purchased
- c. fuel and electricity
- d. **feed purchased**

21. _____ is a measure of the degree of difference between the offspring of a specific bull and the offspring of the average bull of the breed in the trait being measured.

- a. MPV
- b. SPF
- c. OSB
- d. **EPD**

22. The physical appearance of an animal is referred to as:

- a. **phenotype**
- b. genotype
- c. dominance
- d. codominance

23. The length of gestation for swine is an average of how many days?

- a. **114 days**
- b. 148 days
- c. 151 days
- d. 283 days

24. Which animal by-product derived from the pancreas is used in the treatment of diabetes?

- a. cortisone
- b. insulin**
- c. epinephrine
- d. heparin

25. Of the digestive structures listed, _____ is the only one that would **NOT** be found in swine.

- a. villi
- b. large intestine
- c. omasum**
- d. esophagus

Farm Equipment

26. The primary function of a planter is to make the “V” trench. Identify what part of the planter makes the “V” trench?

- a. metering plates
- b. fluted and rippled coulters
- c. the double disk openers**
- d. covering wheels

27. Oil in the cylinder is usually an indication of a worn:

- a. exhaust valve guide
- b. main bearing
- c. intake valve guide**
- d. head gasket

28. The type of electric motor enclosure that must be used to move grain in a feed bin is:

- a. totally enclosed**
- b. drip proof
- c. splash proof
- d. open enclosure

29. Slag is:

- a. weld waste and impurities that form at the top of the weld bead**
- b. easy to remove; promotes rapid cooling
- c. settles to the root of the weld and provides added strength to the weld
- d. a defect that causes brittleness in the weld

30. Inspecting the grain in the grain tank of a combine, we notice a large number of broken seeds. What can the operator adjust to correct this problem?

- a. slow the combine down (less MPH)
- b. speed up the cylinder
- c. slow the cylinder down**
- d. speed up the fan

31. The intake manifold of the diesel engine allows:
- air to enter the cylinder past the intake valve**
 - fuel and air to enter the cylinder past the intake valve
 - fuel to enter the cylinder past the intake valve
 - air to enter the cylinder and exhaust gases to escape
32. Which of the following statements is **NOT** true when describing 3-way electrical switches?
- 3-way switches are used in pairs to control a light or receptacle from two locations
 - 3-way switches have three brass terminals**
 - there are no "on" or "off" markings on 3-way switches
 - 3-way switches have three terminals, one black or copper colored and two brass or silver colored
33. A hydrostatic skid steer is capable of turning very sharp due to:
- the differential in the drive train
 - the final drives in the drive train
 - the locking of hydraulic motors and skidding of tires**
 - the brake system in the drive train
34. A _____ stores electrical energy in an electrostatic field.
- potentiometer
 - transistor
 - rheostat
 - capacitor**
35. At top dead center of the compression stroke of a small gas engine:
- the intake valve is closed and the exhaust valve is open
 - the exhaust valve is closed and the intake valve is open
 - both intake and exhaust valves are open
 - both intake and exhaust valves are closed**
36. In welding, this procedure will usually decrease penetration, assuming all other factors remain constant.
- increasing the amperage
 - using a small diameter electrode
 - slowing the rate of forward travel
 - decreasing electrode angle**
37. The weave bead width should be _____ the diameter of the electrode being used.
- the same as
 - no wider than 2-3 times
 - no wider than 4 times
 - no wider than 6 times**
38. The application rate for field sprayers is usually given in:
- MPH
 - GPA**
 - PSI
 - none of the above

39. Nozzles on a sprayer should be selected to give the proper:

- a. spray patterns
- b. particle size
- c. application
- d. **all of the above**

40. Which of these is **NOT** a part of the cleaning unit on the combine?

- a. fan
- b. chaffer
- c. **beater**
- d. sieve

41. The basic rule for setting reel speed on a combine is:

- a. reel speed is equal to ground speed
- b. reel speed is 50% faster than ground speed
- c. **reel speed is 25% faster than ground speed**
- d. reel speed is 25% slower than ground speed

42. Knife register on a combine cutter bar refers to:

- a. **the centering of the cutter bar knife in the guards at the end of both back and forward motions of the bar.**
- b. the length of the forward stroke of the cutter bar
- c. proper spacing of guards on the header
- d. adjustment is by use of single or dual point knives

43. The principle which states that air flow will increase and air pressure decrease through a narrow passage is known as:

- a. Venturi principle
- b. **Benoulli's principle**
- c. air/fuel ratio
- d. displacement principle

44. When cutting with oxy-acetylene, what is the common reason for a rough edge and uncut material?

- a. excessive preheat
- b. travel speed too slow
- c. lack of preheat
- d. **travel speed too fast**

45. A _____ switch is used to shut off an auger when the grain bin is full.

- a. **limit**
- b. overload
- c. solenoid
- d. overflow

46. When plasma cutting, dross is:

- a. the expelled gas from the torch tip
- b. the wrinkled edge of cut metal
- c. the debris created by the cutting action**
- d. the space of the cut left by the torch tip

47. The _____ transmits power to the driving axles and allows the two rear wheels to turn at different rates of speed while still propelling their share of the load:

- a. transmission
- b. torque converter
- c. differential**
- d. clutch

48. What tool is used to check the freezing protection of an antifreeze solution?

- a. barometer
- b. spectrometer
- c. thermometer
- d. hydrometer**

49. This component responds to changes in moisture in a grain drying system.

- a. thermostat
- b. humidistat**
- c. rheostat
- d. relay

50. This electrical device is used for overcurrent protection and can be reset after being tripped.

- a. fuse
- b. circuit breaker**
- c. GFFC
- d. time delay fuse

Farm Management

51. When local basis increases, it is an indication that:

- a. futures prices are decreasing
- b. local demand is decreasing**
- c. local supply is short
- d. local price is higher than the futures price

52. Working capital is a measure of available:

- a. cash
- b. current assets minus liabilities**
- c. accounts receivables
- d. available short term credit

53. The interest paid on a mortgage is considered:
- liability
 - a variable cost
 - total cost
 - a fixed cost**
54. A farmer rents an adjacent 160 acres of cropland for \$110 per acre to operate with his current 800 acres and existing equipment. The effect on the farmer's costs will be:
- to increase fixed costs per acre
 - to decrease fixed costs per acre**
 - to increase variable costs per acre
 - to decrease variable costs per acre
55. Which of the following is **NOT** included as a gross income under the accrual system?
- value of crops produced
 - increase in value of livestock purchased
 - value of feed fed to livestock**
 - government payments and dividends
56. A cash flow budget projected for next year can provide information on:
- projected borrowing requirements and repayment ability**
 - return to the farm operator's labor and management
 - net worth of the farm business
 - rate of return on the farm investment
57. If a farmer discovered that he had 1,000 more bushels of corn stored than he had estimated when he figured his net farm income for the year, this would:
- raise his actual cash net farm income
 - lower his actual cash net farm income
 - raise his actual accrual net farm income**
 - lower his actual accrual net farm income
58. A corn producer decides to store his soybeans in the local elevator for 4 months. The price at harvest is \$4.50 per bushel and the elevator charges 2 cents per bushel per month for storage plus a 5 cents per bushel handling charge. He has 4,000 bushels to sell and must borrow \$18,000 at 6% annual interest while he stores the corn. What price must he receive for his corn to break even and cover his storage and opportunity costs?
- \$4.58
 - \$4.63
 - \$4.72**
 - \$4.77
59. Chris purchased a group of weaner pigs weighing 12 pounds each and sold them weighing 278 pounds after feeding them for 160 days. Each pig ate 750 pounds of feed during the feeding period. Average daily gain for each pig in the group (gain per day) during the feeding period was:
- 2.95 pounds/day
 - 1.92 pounds/day
 - 1.66 pounds/day**
 - 0.285 pounds/day

60. A farmer purchases 700-pound feeder steers for \$1.80 per pound and plans to sell the steers at 1,300 pounds. The farmer estimates the total cost of gain to be \$0.91 per pound. The nearest breakeven price when the steers are sold at 1,300 pounds is:
- a. \$1.25/pound
 - b. \$1.32/pound
 - c. **\$1.39/pound**
 - d. \$1.43/pound
61. A farmer has total assets of \$500,000 of which land is \$300,000. The farmer's debt to equity ratio is 0.6. What will the farmer's debt to equity ratio be if the land value increases by 10%?
- a. 0.45
 - b. 0.47
 - c. 0.53
 - d. **0.55**
62. Corn has an expected yield of 160 bushels per acre and has a production cost of \$375 per acre. Current market prices are \$5 per bushel for corn and \$13 per bushel for soybeans. Soybeans can be raised at a production cost of \$250 per acre. At what breakeven yield per acre would soybeans generate the same net return per acre as dryland corn?
- a. 41.9 bushels
 - b. 45.2 bushels
 - c. **51.9 bushels**
 - d. 63.3 bushels
63. How many pounds of 48% protein supplement must be mixed with 11% protein wheat to make a ton of 16% protein feed?
- a. **270 pounds**
 - b. 350 pounds
 - c. 400 pounds
 - d. 550 pounds
64. A feedlot operator buys feeder steers, finishes them, and sells them. The operator estimates that finished steers will sell for \$130 per cwt. (100 pounds) and that it will cost \$450 per head to bring them from 750-pound purchase weight to the 1,250-pound selling weight. What is the highest price the operator can pay for 750-pound feeder steers to breakeven?
- a. \$132.17/cwt.
 - b. \$140.83/cwt.
 - c. \$149.18/cwt.
 - d. **\$156.67/cwt.**
65. A producer sells 7 feeder steers for \$180/cwt. (100 pounds). The average weight per steer is 752 pounds. There is a 2% sales commission and yardage fees of \$4 per head. The net amount received for the pen of steers would be:
- a. \$1,026.00
 - b. \$9,186.75
 - c. \$9,187.42
 - d. **\$9,257.70**

66. Assume a market hog weighs 285 pounds when loaded on a truck, weighs 279 pounds when unloaded at the slaughter plant, and yields a carcass that weighs 211 pounds. If the packer pays \$102.50/cwt. (100 pounds) of carcass weight for the hog, what is the equivalent live value of the hog when it left the farm?
- \$75.89/cwt.**
 - \$77.52/cwt.
 - \$79.16/cwt.
 - \$80.55/cwt.
67. Corn and grain sorghum are substitutes for each other in many livestock feed rations. Assuming they are substitutes, an increase in the supply of corn would cause the demand for grain sorghum to:
- shift to the left**
 - shift to the right
 - increase
 - remain unchanged
68. A speculator with a short position in the futures market:
- profits when prices go down, loses when prices go up**
 - profits when prices neither go up nor down
 - profits when prices go up, loses when prices go down
 - loses when prices go down
69. A cattle feeder, wishing to use the futures markets to hedge the price of slaughter cattle, would at the time of his cattle purchase:
- buy futures contracts expecting to sell the contracts when selling cattle
 - sell futures contracts expecting to sell more contracts when selling cattle
 - sell futures contracts expecting to buy contracts when selling cattle**
 - buy futures contracts expecting to buy more contracts when selling cattle
70. A projection of all income and expenses associated with growing an acre of a particular crop would be called:
- a partial budget
 - an enterprise budget**
 - a whole farm budget
 - an income statement
71. A whole farm financial statement that shows all expected revenues and costs is also commonly called a:
- budget**
 - balance sheet
 - partial budget
 - net worth statement
72. Costs that do **NOT** change in the short run regardless of output level for a farm are called:
- opportunity costs
 - fixed costs**
 - variable costs
 - perfectly elastic costs

73. An asset's cost minus the asset's accumulated depreciation = the asset's:

- a. basis
- b. book value**
- c. market value
- d. net worth

74. Which of the following values is **least** likely to appear on a balance sheet?

- a. current assets
- b. net worth
- c. owner's equity
- d. current cash income**

75. A tax-deductible expense:

- a. reduces taxable income**
- b. increases taxable income
- c. impacts expenses but not taxable income
- d. increases taxes owed

General Agriculture

76. The Kansas Department of Agriculture is located in:

- a. Hutchinson
- b. Manhattan**
- c. Salina
- d. Wichita

77. The Kansas Secretary of Agriculture is:

- a. Mike Beam**
- b. Kurt Dillon
- c. Jackie McClaskey
- d. Sonny Perdue

78. The United States Secretary of Agriculture is:

- a. Mike Beam
- b. Mary Kane
- c. Jackie McClaskey
- d. Sonny Perdue**

79. In 2017, Kansas ranked _____ in total agricultural exports.

- a. 1st
- b. 2nd
- c. 7th**
- d. 9th

80. U.S. consumers spend _____ percent on their disposable income on food each year.
- a. 5
 - b. 10**
 - c. 15
 - d. 20
81. Today, each U.S. farmer produces food and fiber for _____ people annual in the United States and abroad.
- a. 128
 - b. 148
 - c. 168**
 - d. 188
82. About _____ percent of all U.S. agricultural products are exported yearly.
- a. 14
 - b. 24**
 - c. 34
 - d. 44
83. The U.S. produces _____ of corn in the world.
- a. 11.9%
 - b. 21.9%
 - c. 31.9%
 - d. 41.9%**
84. The average American consumes _____ gallons of fluid milk each year.
- a. 11 gallons
 - b. 21 gallons**
 - c. 31 gallons
 - d. 41 gallons
85. Today, farmers and ranchers receive only _____ cents of every retail dollar spent on food that is eaten at home and away from home compared to receiving 31 cents in 1980.
- a. 9
 - b. 19**
 - c. 29
 - d. 39
86. The average farm size in Kansas is:
- a. 507 acres
 - b. 607 acres
 - c. 707 acres**
 - d. 807 acres

87. The average age of a Kansas farmer is:

- a. **57 years old**
- b. 67 years old
- c. 77 years old
- d. 87 years old

88. The top agriculture commodity for the United States is:

- a. broilers
- b. **corn**
- c. dairy products
- d. cattle and calves

89. The top agriculture commodity for Kansas is:

- a. **cattle and calves**
- b. corn
- c. grain sorghum
- d. wheat

90. Which Kansas agricultural crop commodity represents the highest percentage of the overall U.S. value?

- a. corn
- b. **grain sorghum**
- c. soybeans
- d. wheat

91. What percentage of U.S. farms are owned by individuals, family partnerships or family corporations?

- a. 68%
- b. 78%
- c. 88%
- d. **98%**

92. Farm acreage accounts for _____ percent of the total land in Kansas

- a. 68.6%
- b. 78.6%
- c. **88.6%**
- d. 98.6%

93. Which U.S. president established the United States Department of Agriculture?

- a. **Abraham Lincoln**
- b. George Washington
- c. Theodore Roosevelt
- d. Thomas Jefferson

94. In 2018, which of the following categories of Kansas agricultural exports was NOT in the top five nationally for Kansas?

- a. **All Hay**
- b. All Wheat
- c. Sorghum for Grain
- d. Sorghum for Silage

95. In 2017, Kansas ranked _____ in wheat exports.

- a. 1st
- b. 2nd**
- c. 3rd
- d. 4th

96. In 2017, Kansas ranked _____ in beef and veal exports.

- a. 1st
- b. 3rd**
- c. 5th
- d. 7th

97. In 2018, Kansas ranked _____ in total sorghum for grain production.

- a. 1st**
- b. 2nd
- c. 3rd
- d. 4th

98. In 2018, Kansas ranked _____ in total cropland production.

- a. 1st
- b. 2nd**
- c. 3rd
- d. 4th

99. In 2018, Kansas ranked _____ in total all cattle and calves production.

- a. 1st
- b. 3rd**
- c. 5th
- d. 7th

100. In what year did President Lincoln sign the Morrill Land Grant Collect Act?

- a. 1852
- b. 1862**
- c. 1872
- d. 1882