



Agronomy Career Development Event

Created: Nov-19

50 Question Multiple Choice - Choose the best answer.

WRITTEN EXAM – NUTRIENT MANAGEMENT

- pH is the measurement of the concentration of what ion in the soil?
 - hydroxide
 - hydrogen**
 - phosphorus
 - helium
- Soil samples for distinctly different areas of the field should be (i.e. different soil types or hill tops vs. bottom lands):
 - analyzed separately**
 - mixed together to represent a single production unit
 - ignored as being meaningless
 - mixed together for large fields and kept separate for small fields
- What is the conversion of ammonium to nitrate known as?
 - ammonification
 - denitrification
 - mineralization
 - nitrification**
- When do broadcast applications of dry fertilizer become plant available?
 - when crop residues are decomposed
 - after irrigation or rainfall dissolves the fertilizer and moves into the root zone**
 - when is tilled 6 to 8 inches into the soil with a tillage tool
 - when soil temperatures rise above 70 degrees Fahrenheit
- What are national regulatory agencies regulating manure applications most concerned about?
 - excessive phosphorus**
 - phosphorus deficiency
 - excessive potassium
 - potassium deficiency

6. When thinking of crop nutrient fertilization, what does agronomic rate of application mean?
- A. applying a balanced amount of nutrients
 - B. **matching fertilizer inputs with crop requirements under given soil conditions**
 - C. applying both a broadcast and starter fertilizer along with a side-dress treatment
 - D. applying only a broadcast and starter fertilizer
7. What do the 4R's of fertilizer application refer to?
- A. The Right price, Right brand, Right rate, Right place
 - B. The Right source, Right rate, Right price, Right form
 - C. **The Right source, Right rate, Right time, Right place**
 - D. The Right price, Right rate, Right form, Right analysis
8. What is the key benefit to banding phosphorus fertilizers?
- A. less phosphate leaching
 - B. a concentrated alkaline zone
 - C. **less tie up in the soil leading to better plant availability**
 - D. required for higher fertilizer rates
9. Visual symptoms of zinc deficiency usually appear as:
- A. **chlorosis**
 - B. twisted stems
 - C. pale foliage on older leaves first
 - D. stem pitting
10. _____ is adsorbed as a cation and is part of the chlorophyll molecule.
- A. Na^+
 - B. H^+
 - C. Ca^{+2}
 - D. **Mg^{+2}**

WRITTEN EXAM – PEST MANAGEMENT

11. Select the condition that could help reduce pesticide volatilization.
- A. high air temperatures
 - B. low relative humidity
 - C. **incorporation**
 - D. small droplets

12. A weed is described as?
- A. **a plant that is not valued where it is growing**
 - B. a fast-growing plant
 - C. a plant that lives for more than one year
 - D. a plant growing from a seed
13. What type of flowering plant takes 12-24 months to complete its life cycle? It grows vegetative the first year and then reproduces the second year.
- A. annual plant
 - B. **biennial plant**
 - C. triennial plant
 - D. perennial plant
14. Epinasty in plants is described as:
- A. **the twisting and bending of plant leaves and stems due to an auxin**
 - B. the discoloration of leaves caused by a toxin
 - C. interveinal yellowing of leaves caused by a nutrient deficiency
 - D. spotting of leaves from a contact herbicide
15. Which type of insecticide moves throughout the plant?
- A. photosynthetic
 - B. **systemic**
 - C. contact
 - D. juvenile
16. Plant diseases occur when the following occur at the same time:
- A. **a susceptible plant, a virulent pathogen, and a favorable environment**
 - B. a susceptible plant, a virulent pathogen and insect pests
 - C. a virulent pathogen, an environment favorable for disease and insect pests
 - D. a susceptible plant, insect pests, and freezing temperatures
17. Spray drift is the least when which of the following conditions exist?
- A. droplet size increases, wind speed increases
 - B. droplet size decreases, wind speed decreases
 - C. droplet size decreases, wind speed increases
 - D. **droplet size increases, wind speed decreases**

18. What does IPM stand for?
- A. Intensive Pesticide Management
 - B. Intensive Personnel Management
 - C. **Integrated Pest Management**
 - D. Intensive Pest Manipulation
19. Which of these is an example of biological aphid control?
- A. using an insect growth regulator
 - B. **introduction and protection of natural predators**
 - C. destroying all-natural predators
 - D. setting and maintaining traps
20. After a herbicide drifts onto a plant, only small spots on the plant leaves and stem are dead. The herbicide that drifted was most likely what type of herbicide?
- A. **contact**
 - B. systemic
 - C. adsorptive
 - D. generic

WRITTEN EXAM – SOIL AND WATER MANAGEMENT

21. How does soil texture influence the development of soil compaction?
- A. **Clay soils are more likely to suffer compaction than are sandy soils.**
 - B. Sandy soils are quite subject to compaction when dry.
 - C. It is basically impossible to compact a silt loam.
 - D. The amount of water present is far more important than its textural class.
22. A sodic soil is characterized by having a disproportionately high concentration of what exchangeable cation in the Cation Exchange Capacity (CEC) complex?
- A. calcium
 - B. chloride
 - C. magnesium
 - D. **sodium**

23. The point at which soil holds moisture so tightly that plants cannot extract it is called?
- A. **the permanent wilting point**
 - B. the drought point
 - C. field capacity
 - D. the transient wilting point
24. Compaction is the reduction of:
- A. soil CEC
 - B. soil weight
 - C. **soil pore space**
 - D. soil density
25. What is a horizontal layer of soil, created by soil forming processes, that differ in physical or chemical properties from adjacent layers called?
- A. hardpan
 - B. **soil horizon**
 - C. fragipan
 - D. tillage pan
26. What soil contains significant amounts of naturally occurring calcium carbonate? These soils are characterized by a high soil pH and fizz when a dilute acid is applied.
- A. **calcareous soil**
 - B. mineral soil
 - C. volcanic soil
 - D. organic soil
27. _____ is an eroded material deposited by running water including gravel, sand, silt, and clay.
- A. Bedrock
 - B. Glacial till
 - C. A loess deposit
 - D. **An alluvial deposit**

28. What causes clay soils to often drain slower than loam soils following heavy rain or irrigation?
- A. clay soils have more sodium
 - B. clay soils have smaller diameter pores**
 - C. loam soils have less total pore space
 - D. clay soils often have less organic matter
29. Nutrient leaching is most likely to occur in what soil type?
- A. silty clay soil
 - B. clay soil
 - C. compacted soil
 - D. sandy soil**
30. 70-80% of soil compaction severity occurs with the _____ tire pass although the depth of the compaction is determined by the _____ axle load.
- A. first, lightest
 - B. first, heaviest**
 - C. last, lightest
 - D. last, heaviest

WRITTEN EXAM – CROP MANAGEMENT

31. Which system uses a constellation of orbiting satellites to identify a location on Earth based on longitude and latitude coordinates along with altitude?
- A. Geographic Directional Coordinates (GDC)
 - B. Variable Rate Technology (VRT)
 - C. Geographic Information System (GIS)**
 - D. National Air and Space Association (NASA)
32. Growing two or more crops together in the same field at the same time is known as?
- A. intercropping**
 - B. strip till
 - C. continuous cropping
 - D. double crop

33. At which stage of growth should plant tissue samples should be taken?
- A. sufficiently in advance of fertilization to allow time for analysis and return of results from the lab
 - B. any time before bloom
 - C. early season shortly after emergence
 - D. **the stage that corresponds to those used to develop interpretive guidelines**
34. What is the name of the group of nitrogen-fixing bacteria in legume nodules?
- A. nitrosomonas bacteria
 - B. nonsymbiotic bacteria
 - C. rhizome bacteria
 - D. **rhizobium bacteria**
35. In small grain production, jointing refers to which of the following?
- A. tiller production
 - B. the head is in the boot
 - C. **the first node is visible above the soil surface**
 - D. the flag leaf has emerged
36. Which of the following definitions best describes a petiole?
- A. the surface of the leaf
 - B. **the small stem attached to the leaf**
 - C. the vein structure in the leaf
 - D. the edge of the leaf
37. What is the growth of a plant toward any stimulus is called?
- A. **tropism**
 - B. hormones
 - C. receptors
 - D. vernalization

38. Name the condition in which stalks or stems break or fall over above the soil surface because of weak stalks, weak roots, damage, or weather events.
- A. germination
 - B. **lodging**
 - C. maturation
 - D. emergence
39. A _____ plant has a fibrous root system and parallel venation.
- A. annual
 - B. biennial
 - C. dicot
 - D. **monocot**
40. What is the pigment associated with sugar metabolism, when it accumulates in the plant, it gives the plant a reddish/purple color?
- A. chlorophyll
 - B. carotenoid
 - C. **anthocyanin**
 - D. xanthophyll

WRITTEN EXAM – CALCULATIONS

41. A fertilizer spreader has an effective application width of 37.5 feet. If 21.6 pounds of fertilizer is collected from the spreader in 60 seconds. When traveling 6.8 mph, what is the rate of fertilizer that is being applied per acre with this spreader?
- A. 3.2
 - B. 11.1
 - C. **41.9**
 - D. 54.5
42. Approach Prima Fungicide is used at the rate of 6.8 fl oz/ac on soybean for the control of Frog Eye and Brown Spot. How many acres will a 2.5-gal jug treat?
- A. 5.9 acres
 - B. 11.8 acres
 - C. 23.6 acres
 - D. **47.1 acres**

43. A wheat farmer is budgeting expenses for his coming growing season as this time he projects his total expenses to be \$412.80 per acre. His average wheat yield is 80 bu/ac. What is his breakeven price per bushel?
- A. **\$5.16**
 - B. \$5.29
 - C. \$6.49
 - D. \$7.74
44. Current university research shows a soybean yield response to the application of 20 pounds of sulfur preplant. How much 21-0-0-24 per acre do you need to spread?
- A. 4.2 pounds/ac
 - B. 4.8 pounds/ac
 - C. **83.3 pounds/ac**
 - D. 93.3 pounds/ac
45. UAN fertilizer at 28% nitrogen costs \$226.50 per ton. The liquid fertilizer weighs 10.67 pounds per gallon. What is the per pound cost for the nitrogen?
- A. \$0.37/pound
 - B. **\$0.40/pound**
 - C. \$0.55/pound
 - D. \$0.63/pound

Using the following information answer the next five questions (46-50).

Traci is making plans to seed her field to winter six-row malting barley on her farm in Maryland. The field is capable of producing 135 bu/acre under irrigation. The field has a center pivot irrigation system with eight 156 ft spans and an end gun that effectively reaches 50 ft. Traci will plant in concentric circles under the pivot and leave the dry corners fallow. She is targeting 1.25 million plants per acre, the seed she had purchased has 13,500 seeds per pound and 92% germination. Barely weighs 48 pounds per bushel. Total nitrogen for the crop will be 1.2 pounds of nitrogen per bushel of grain. She plans on applying 30 pounds of nitrogen broadcast preplant and the remainder in two spring (top-dress) applications. Soil tests were used to make fertilizer recommendations, the recommendations call for 83.7 pounds of P_2O_5 and 47.3 lbs/ac K_2O to be broadcast preplant.

46. What is the area of Traci's field?
- A. .19 acre
 - B. 112.3 acres
 - C. **121.4 acres**
 - D. 485.8 acres

47. What will the total nitrogen program per acre be?
- A. 132 pounds of N per acre
 - B. **162 pounds of N per acre**
 - C. 178 pounds of N per acre
 - D. 192 pounds of N per acre
48. What is Traci's target seeding rate?
- A. 85.2 pounds per acre
 - B. 92.6 pounds per acre
 - C. **100.6 pounds per acre**
 - D. 112.3 pounds per acre
49. How much 0-0-60 will Traci need to apply preplant?
- A. **78.8 pounds per acre**
 - B. 83.7 pounds per acre
 - C. 111.1 pounds per are
 - D. 139.5 pounds per acre
50. If Traci uses UAN 28-0-0 for her spring nitrogen applications, how many total gallons of UAN per acre will she need for her split spring top-dress applications? (1 gal UAN weighs 10.67 pounds)
- A. 10.0 gallons/ac
 - B. 17.2 gallons/ac
 - C. 23.8 gallons/ac
 - D. **44.2 gallons/ac**

**2018 National FFA Agronomy CDE Written Test
For Event Use Only**

Select the best answer for each question

1. Which of the following essential nutrients is considered a secondary nutrient?
 - a. phosphorus
 - b. calcium**
 - c. potassium
 - d. manganese
 - e. zinc

2. From the following list, which oral LD50 value represents the most toxic poison?
 - a. 300 mg/kg
 - b. 480 mg/kg
 - c. 5000 mg/kg
 - d. 101 mg/kg**

3. If you wanted to increase the CEC (cation exchange capacity) of your soil, which of the following additives would you add to your soil?
 - a. apply ammonium sulfate to the soil at least once a year
 - b. rotate your crops annually
 - c. add organic matter (compost, manure, green manure crops, etc.) to your soil**
 - d. moldboard plow your soil to incorporate crop residues

4. If a plant continues to produce more leaves and stems after it has begun to flower, that growth habit is called which of the following?
 - a. dioecious
 - b. epinasty
 - c. determinate
 - d. monoecious
 - e. indeterminate**

5. If you were using a chlorophyll meter to determine the nutrient status of a corn crop, which nutrient below is most likely to be correlated with the level of chlorophyll?
 - a. N**
 - b. P
 - c. K
 - d. Fe
 - e. S

6. If a 10-25-10 fertilizer costs \$450/U.S. ton (2,000 lbs in a U.S. ton), how much did you pay per pound of all the nutrients present (round to the nearest penny)?
- \$0.27/lb
 - \$0.50/lb**
 - \$0.89/lb
 - \$1.01/lb
7. A farmer has all-inclusive production costs for his crop of \$884 per acre. The farmer sold the crop ahead of harvest season using a future's contract for \$5.20 per bushel so how many bushels per acre does the farmer need to achieve to cover just the production costs?
- 170 bushels per acre**
 - 180 bushels per acre
 - 200 bushels per acre
 - 225 bushels per acre
8. Which of the following is a plant available form of nitrogen?
- N_2
 - NH_3
 - NO_3**
 - NO_2
 - NO
9. A raceme is considered a type of what?
- tiller
 - inflorescence**
 - root structure
 - leaf structure
10. Which of the following plants are considered examples of pulses?
- barley, rye, rice
 - white clover, alfalfa, crimson clover
 - canola, flax, corn
 - peas, lentils, dried beans**
11. What is the primary role of phosphorus in plant growth?
- enzymatic activation
 - carbohydrate metabolism
 - energy transfer and storage**
 - stomata (water) regulation

12. The hilum of a bean seed is what?
- the thin shell covering of the seed
 - where the radicle first emerges from a germination seed
 - where the seed is attached to the pod**
 - where the first leaves form
13. A mixture of proteins that gives bread its elastic texture is called what?
- gluten**
 - glucosinates
 - amino acids
 - omega 3's
14. Corn is an example of what type of plant?
- dicot
 - monoecious plant**
 - dioecious plant
 - legume
 - gynoecious
15. The plant structure that develops because of a fertilized flower on the peanut plant is called a what?
- stolon
 - rhizome
 - corm
 - boll
 - peg**
16. In a corn crop, stage R2 refers to what?
- denting
 - 50% milk line
 - tasseling
 - blister**
17. How many acres are in one section?
- 160 acres
 - 640 acres**
 - 333 acres
 - 400 acres

18. Purple seed stain is a common disease found in which of the following crops?
- a. corn
 - b. cotton
 - c. canola
 - d. soybeans**
 - e. barley
19. In cool moist springs, the ergot fungus can infect the floret of certain grasses and develops a fruiting body, a hard dry sclerotium inside the husk of the floret. This blackish sclerotia mimics to some degree the grain produced by the grass crop. The most common grain infected and one that can impact bread making is which of the following?
- a. Wild rice
 - b. Oats
 - c. Rye**
 - d. Corn
20. Why is it important to spray preemergence herbicides before a rain or scheduled irrigation?
- a. to decrease the chances of chemical runoff
 - b. to increase the rate of chemical breakdown
 - c. to decrease the rate of microbial activity
 - d. to move the herbicide into the weed germination zone**

Using the following information answer the next five questions (21-25).

John, a farmer in Missouri, is planting a field of corn which measures 2026' by 1400'. He will use a no-till planter and apply fertilizer at the same time that he seeds the field using both a liquid broadcast sprayer mounted ahead of the planter and dry fertilizer placed in a band 2 inches to the side and 2 inches below the seed. The broadcast liquid fertilizer will be at a rate of 8 gallons per acre of 30% UAN (urea-ammonium nitrate solution with a density of 10.83 lbs/gallon and having 3.25 lb N/gallon) at a cost of \$0.57/lb of nitrogen. His banded dry starter fertilizer is 11-52-0 that costs \$600/ton and will be applied at 25 pounds per acre. He has a target population of 34,000 plants per acre for this irrigated corn field. His corn seed lot tested 90% germination guaranteed so he figures that he will need to plant 38,000 seeds per acre to ensure obtaining a final population of 34,000 plants/acre. A bag of corn contains 80,000 kernels.

21. How many acres are in the field John is planting?
- a. 12.1
 - b. 35.9
 - c. 65.1**
 - d. 75.6

22. How many total pounds of nitrogen did John apply during the seeding operation as broadcast liquid fertilizer plus banded dry fertilizer?
- a. 2.75 lbs N/acre
 - b. 14.5 lbs N/acre
 - c. 26.0 lbs N/acre
 - d. **28.75 lbs N/acre**
23. How many total pounds of phosphorus (P_2O_5) did John apply during the seeding operation?
- a. **13.0 lbs P_2O_5 /acre**
 - b. 26.0 lbs P_2O_5 /acre
 - c. 35.88 lbs P_2O_5 /acre
 - d. 38.08 lbs P_2O_5 /acre
24. What is the cost per acre of the total starter fertilizer package that John is applying during the seeding operation (broadcast and banded)?
- a. \$42.03/acre
 - b. **\$22.32/acre**
 - c. \$14.82/acre
 - d. \$7.50/acre
25. How many bags of corn seed should John order from his local co-op? (Round up to the next whole bag if fractionally above a whole number.)
- a. **31 bags**
 - b. 28 bags
 - c. 25 bags
 - d. 34 bags
26. A definition of an annual plant is which of the following?
- a. a plant that grows one year then flowers and reproduces the next
 - b. a plant that reproduces only by vegetative parts
 - c. **a plant that grows, flowers and reproduces in one growing season**
 - d. a plant that lives more or less indefinitely, keeps coming back each year
27. The fixation of nitrogen from the atmosphere occurs in which group of plants?
- a. cereal grains such as wheat barley, oats
 - b. **legumes such as clovers, peas, alfalfa, beans**
 - c. vegetable crops such as carrots, squash, watermelon
 - d. oilseed crops such as canola

28. The release of a substance by one plant that is toxic to another plant is known by what term?
- alleopathy**
 - symbiosis
 - abiotic
 - autotrophic
29. You buy a 50-lb bag of fertilizer with a grade of 14-5-10. With respect to pounds of nutrients as represented by the bag's label, what did you buy?
- 7 lbs of nitrogen (N), 2.5 lbs of P, and 10 lbs of K_2O
 - 14 lbs of N, 5 lbs of P_2O_5 , and 10 lbs of K_2O
 - 7 lbs of N, 2.5 lbs of P, and 4.15 lbs of K_2O
 - 7 lbs of N, 2.5 lbs of P_2O_5 , and 5 lbs of K_2O**
30. Which soil structure would be typical for a good seed bed?
- massive
 - platy
 - granular**
 - blocky
31. Which of the following have chewing mouth parts?
- aphids
 - earwigs**
 - adult moths
 - leafhoppers
32. Of the following practices, which one is important to follow to insure the safety of pollinating bees?
- avoid unnecessary insecticide use
 - use low hazard insecticide formulations
 - time spray application when bees are inactive.
 - all of the above**
33. Carrots raised for seed are examples of what type of plant?
- annuals
 - perennials
 - biennials**
 - spring annuals

34. Lodging in grains tends to happen because a grower has applied an excess of which nutrient when growing conditions are good?
- a. sulfur
 - b. potassium
 - c. phosphorous
 - d. nitrogen**
35. Vernalization is a process some plants require to flower and produce seed. An example of a crop that needs vernalization is which of the following?
- a. winter wheat**
 - b. sweet corn
 - c. dent corn
 - d. cotton
36. Ginned cotton is cotton that has undergone what?
- a. had the seed removed**
 - b. boll opening
 - c. flowering
 - d. has had a defoliate applied
37. Seeding emergence is hindered by which of the following?
- a. plow pans
 - b. deep clay layers
 - c. surface crusting**
 - d. warm, wet weather
38. Some weeds show herbicide resistance because:
- a. weeds are finding ways to reproduce in different methods
 - b. the same herbicide has been used year after year**
 - c. more organic farming is taking place
 - d. their seeds live in the soil for many years
39. How are loess soils deposited?
- a. wind**
 - b. glaciers
 - c. water
 - d. equipment
40. Chlorosis can be defined as what?
- a. failure of flowers to produce pollen
 - b. failure of roots to absorb water
 - c. shrinking or narrowing of the xylem
 - d. pale, yellow or bleached leaves**

41. A crop of barley can best take up which of the following forms of nitrogen?
- a. nitrite
 - b. atmospheric nitrogen
 - c. nitrate**
 - d. 0-46-0
42. Which of the following characteristics is used to identify grass weed seedlings?
- a. leaf arrangement
 - b. presence or absence of ligules**
 - c. simple versus compound leaf
 - d. pubescence on the cotyledons
43. The method of applying P (phosphorus) that usually results in the most available P is what?
- a. banded**
 - b. broadcast
 - c. top dressed
 - d. broadcast following by disking
44. Which of the following is NOT one of the three sides of the disease development triangle?
- a. environment
 - b. antigen**
 - c. host
 - d. pathogen
45. Your soil test shows that you need 40 lbs of P_2O_5 per acre to produce the desired bushels of wheat per acre. If you are applying potassium phosphate (0-52-35), how many pounds of the fertilizer should you apply (Round up to the next highest whole number)?
- a. 77**
 - b. 73
 - c. 49
 - d. 83
46. In question 45, how many pounds of potassium (K_2O) did you apply to the soil?
- a. 35
 - b. 27**
 - c. 22
 - d. 17
47. Which of the different stages of growth of a corn plant is most affected by drought?
- a. cotyledon
 - b. rooting
 - c. dry down before harvest
 - d. reproductive**

48. The apical stem on your canola crop has been slightly damaged by spray drift. It may regrow from what structure?
- a. internodes
 - b. radicle
 - c. **axillary buds**
 - d. cotyledons
49. Which of the following soil types would best be described as formed from organic matter?
- a. **Histosols**
 - b. Vertisols
 - c. Inceptisols
 - d. Vertisols
50. What is another description for the term rhizome?
- a. tuber
 - b. crown
 - c. horizontal above ground stem
 - d. **horizontal underground stem**

**Key for 2018 National FFA Agronomy CDE Written Test
For Event Use Only**

- | | | | |
|-----|---|-----|---|
| 1. | b | 26. | c |
| 2. | d | 27. | b |
| 3. | c | 28. | a |
| 4. | e | 29. | d |
| 5. | a | 30. | c |
| 6. | b | 31. | b |
| 7. | a | 32. | d |
| 8. | c | 33. | c |
| 9. | b | 34. | d |
| 10. | d | 35. | a |
| 11. | c | 36. | a |
| 12. | c | 37. | c |
| 13. | a | 38. | b |
| 14. | b | 39. | a |
| 15. | e | 40. | d |
| 16. | d | 41. | c |
| 17. | b | 42. | b |
| 18. | d | 43. | a |
| 19. | c | 44. | b |
| 20. | d | 45. | a |
| 21. | c | 46. | b |
| 22. | d | 47. | d |
| 23. | a | 48. | c |
| 24. | b | 49. | a |
| 25. | a | 50. | d |

National FFA Agronomy CDE Written Test 2017

1. You are spraying your customer's lot in town with an insecticide to control aphids. The lot is 10,890 square feet. The insecticide you are using states a maximum of 18 oz. per acre. If you use the maximum rate of application, how many ounces of the insecticide could you use?
 - a. 18
 - b. 4.5**
 - c. 9
 - d. 12
2. Which of the following have chewing mouth parts?
 - a. earwigs**
 - b. adult moths
 - c. leafhoppers
 - d. aphids
3. An adjuvant is:
 - a. a type of disinfectant for pruners
 - b. in the pyrethroid chemical class
 - c. a spreader sticker or other application enhancer**
 - d. a type of biological control for certain weeds
4. Which of the following pesticides can be absorbed by the plant and translocated within the plant?
 - a. contact
 - b. systemic**
 - c. adsorptive
 - d. volatile
5. Knowledge of the stages in a pest life cycle, insect or disease, is important because:
 - a. not all stages cause damage or warrant control
 - b. stages vary in their susceptibility to control strategies
 - c. not all stages look alike
 - d. all the above**

6. Keeping crops or desired plants vigorous, healthy, and competitive with weeds is an example of a _____ type of weed control.

- a. mechanical
- b. chemical
- c. biological
- d. cultural**

7. Established perennial weeds are more difficult to control than annual weeds because:

- a. perennial weeds start growth earlier in the spring than annual weeds
- b. perennial weeds are not sensitive to most herbicides
- c. perennial weeds are much bigger than annual weeds
- d. perennial weeds have stored energy reserves that can support plants when stressed**

8. Which of the following soil types would contain a type of expansive clay that is cracked part of the year?

- a. vertisols**
- b. histosols
- c. inceptisols
- d. peptosols

9. Mycotoxins are poisonous chemical compounds sometimes found in grain samples. They are produced by:

- a. bacteria
- b. viruses
- c. nematodes
- d. fungi**

10. In wheat, Feekes' developmental stage 10, or in the "Boot" refers to the stage when the:

- a. head is about to appear**
- b. seedling emerges
- c. head of wheat is ripe
- d. second node appears on the stem

11. Safflower and sunflower are in the:

- a. cucurbit family
- b. composite family**
- c. nightshade family
- d. legume family

12. One of your customers has asked your company to spray his fallow ground in the spring to kill the early weeds and volunteer wheat from last years' crop. He plans to no-till seed this land in the fall. The land he wants sprayed is 1 mile X 1 mile. Your company will use a glyphosate product at a rate of 20 ounces per acre and an adjuvant at a rate of 4 ounces per acre. How many gallons of glyphosate will be used on this land?

- a. **100**
- b. 128
- c. 640
- d. 1,280

13. If the adjuvant costs \$35 for 1 gallon. What is the total cost of the adjuvant for spraying the land in question 12?

- a. 20
- b. 35
- c. 70
- d. **700**

14. As you walk thru your field you notice a slight twist to some plant leaves and a slight turn of the main stem on several plants, but only once in a while. The most probable cause of this is:

- a. too much moisture
- b. too little moisture
- c. **herbicide residue**
- d. excessive potassium

15. Phytotoxicity is best defined as damage from:

- a. the sun
- b. **chemicals**
- c. water
- d. insects

16. Which of the following insect stages is generally the most damaging?

- a. **larva**
- b. egg
- c. adult
- d. pupa

17. The yellowing of green plant tissue is commonly referred to as:

- a. blight
- b. chlorophyll
- c. chlorosis**
- d. scab

18. Openings in leaves and stems through which gases and moisture pass are called:

- a. spores
- b. stomata**
- c. mycelium
- d. inoculum

19. A juvenile form of an insect that undergoes simple metamorphosis is called a :

- a. pupa
- b. larva
- c. nymph**
- d. predator

20. Aphids, going from one plant to the next spread bacterial diseases throughout the field. In this scenario the aphid is a:

- a. vector**
- b. toxin
- c. pathogen
- d. parasite

21. Broadleaf plants:

- a. reproduce by rhizomes
- b. tend to have parallel leaf veins
- c. are rarely a weedy problem in agriculture
- d. have two seed leaves**

22. The three sides of the disease development triangle are host, pathogen and:

- a. antigen
- b. environment**
- c. moisture
- d. heat

23. What soil structure would be typical for a good seed bed?

- a. **granular**
- b. blocky
- c. platy
- d. massive

24. Contact herbicides:

- a. generally translocate from roots to leaves
- b. **do not control most established perennial weeds species unless applied repeatedly**
- c. usually do not cause visible symptoms on susceptible weeds until after several days
- d. all the above

25. Rhizobium bacteria cause:

- a. mold growth and toxins in wet corn
- b. falling numbers in grading wheat
- c. **nitrogen fixation in legumes**
- d. nematode populations to increase

26. _____ has a spike type of inflorescence:

- a. oats
- b. **barley**
- c. peas
- d. carrot

27. Which of the following crops reproduce asexually:

- a. **strawberry**
- b. timothy
- c. sugar beets
- d. flax

28. Insects are capable of emitting a chemical that will influence the behavior of another insect of the same species. These chemicals are called:

- a. pyrethroids
- b. glucosinolates
- c. glucosamines
- d. **pheromones**

29. Of the following factors, which one is NOT used to determine grain grades?

- a. heat damage
- b. foreign material
- c. moisture**
- d. smell

30. Which of the following farming practices would yield the largest amount of carbon sequestration over the very long term?

- a. continual no-till grain operation**
- b. a 10 year CRP contract
- c. traditional cultivation methods
- d. a crop rotation including hay for a period of 4 years

31. An example of a predatory insect is:

- a. green lacewing
- b. corn earworm
- c. lady beetle
- d. both A and C**

32. Of the following practices, which one is important to follow to insure the safety of pollinating bees:

- a. avoid unnecessary insecticide use
- b. use low hazard insecticide formulations
- c. time spray applications when bees are inactive
- d. all the above**

33. Chemical drift problems can be reduced by:

- a. lowering pressure and decreasing the nozzle orifice
- b. Increasing pressure and increasing the nozzle orifice
- c. spraying upwind of a sensitive area and leaving an untreated border
- d. placing a spray boom as close to the target as possible**

34. The upper level of the water-saturated zone in the soil is called the:

- a. water table**
- b. aquifer
- c. groundwater
- d. surface water

35. The signal word on pesticide labels, i.e. warning, hazard, indicate its:

- a. effectiveness
- b. toxicity**
- c. compatibility
- d. carcinogenicity

36. The most common route of pesticide exposure leading to poisoning is:

- a. skin**
- b. inhalation
- c. thru the eyes
- d. by swallowing

37. Which of the following describe the dodder plant:

- a. parasitic
- b. no leaves
- c. no chlorophyll
- d. all the above**

38. Your neighbor is raising carrot seed for a large seed company. He plants the carrot seed in March of 2017. When should he expect to harvest the carrots for seed?

- a. in September of 2017
- b. in September of 2018**
- c. in March of 2019
- d. in September of 2019

39. Which of the following plants is considered a perennial?

- a. wheat
- b. corn
- c. alfalfa**
- d. beans

40. A recent soil test indicates you need to apply 80 pounds of nitrogen to reach your yield goals for your crop. If you use a fertilizer with 46% nitrogen, how many pounds of fertilizer do you need to apply per acre?

- a. 17
- b. 47
- c. 147
- d. 174**

41. Field bindweed has a:

- a. simple leaf**
- b. palmate leaf
- c. pinnately leaf
- d. pinnately compound leaf

42. The term sustainable agriculture means:

- a. an integrated system of plant and animal production practices having a site-specific application
- b. a method to satisfy human food and fiber needs
- c. a way to enhance the quality of life for farmers and society as a whole
- d. all the above**

43. Tropism is the reaction:

- a. a plant has to growth hormones
- b. to cold temperatures that cause flowering
- c. of a plant to any stimulus**
- d. to certain chemicals, both organic and synthetic

44. Leaching of nitrogen is most likely to occur in which of the following soil type?

- a. sandy**
- b. clay
- c. silty clay
- d. loamy

45. The most common type of peanut grown in the U. S. is the:

- a. Virginia
- b. Runner**
- c. Spanish
- d. Valencia

46. Linseed oil is processed from:

- a. corn oil
- b. flax**
- c. soybeans
- d. canola oil

47. Cotton seeds, canola and soybeans are all crushed and used for their oil. After the oil is removed, the remaining or spent seed material is called:

- a. hummus
- b. mulch
- c. grit
- d. meal**

48. Of the following insects which one is most likely to develop insecticide resistance because of multiple generations per year?

- a. alfalfa weevil
- b. cricket
- c. aphid**
- d. grasshopper

49. An example of a GAP, or, Good Agricultural Practices is:

- a. control of animals in your fields**
- b. a highly skilled labor force
- c. the use of modern technology in fertilizer application
- d. wise use of government programs through the FSA

50. A practice used in some crops to dry foliage before harvest is called:

- a. mineralization
- b. dry down
- c. chemical desiccation**
- d. fallowing

National Agronomy CDE Test 2016: Answers at End

1. What is considered to be stored food in plants?
 - a. fats
 - b. carbohydrates
 - c. proteins
 - d. fructose

2. An onion is a :
 - a. modified stem
 - b. modified leave structure
 - c. corm
 - d. bulb

3. The method of irrigation which is least subject to water loss by evaporation is:
 - a. surface drip
 - b. subsurface drip
 - c. ditch and rill
 - d. sprinkler

4. Which of the following crop is in the nightshade, or solanaceae, family?
 - a. potato
 - b. peanut
 - c. popcorn
 - d. cabbage

5. Which of the following soil types would be described as strongly leached, acid, forest soils?
 - a. Vertisols
 - b. Histosols
 - c. Inceptisols
 - d. Peptosols

6. Which of the following is an uptake form of nitrogen?
 - a. NO_3
 - b. NH_3
 - c. N_2
 - d. NO_2

7. Which of the following soil textures would likely have the lowest soil fertility?

- a. clay
- b. loamy sand
- c. silt loam
- d. sand

8. A chlorophyll meter determines if _____ is sufficient in a plant.

- a. P
- b. K
- c. S
- d. N

9. _____ is a major factor in the way pests are transported to host crops.

- a. wind
- b. water
- c. fog
- d. snow

10. If you want to maximize the amount of vegetative cover left on the soil, which of the following tillage practices should you use?

- a. moldboard plow
- b. no till
- c. strip till
- d. ridge tillage

11. You farm a half section of canola. Your field man suggests you apply Treflan at a rate of 2 pint per acre. Treflan costs \$ 18.50 per gallon. How many gallons of Treflan should you buy?

- a. 8
- b. 54
- c. 48
- d. 80

12. What will be the cost of the Treflan for the crop?

- a. \$5,920
- b. \$1,480
- c. \$2,350
- d. \$ 320

13. Which of the following is an advantage of a crop rotation over a monoculture system?

- a. risk is spread across more than one crop
- b. timing of fertilizer and pesticide application is easier
- c. less equipment is usually needed
- d. a higher level of management is required

14. The offspring of two plants which differ genetically are :

- a. clones
- b. hybrids
- c. sisters
- d. parents

15. Which of the following is NOT one of the three sides of the disease development triangle?

- a. antigen
- b. environment
- c. host
- d. pathogen

16. The textural class of soil that is 10 percent clay and 35 percent sand is:

- a. sandy loam
- b. sand
- c. silt loam
- d. loamy sand

17. If a herbicide label calls for the herbicide to be incorporated. This means the herbicide needs to be:

- a. incorporated into water
- b. incorporated into the soil
- c. incorporated with another herbicide
- d. incorporated with fertilizer

18. Which soil structure would be typical for a good seed bed?

- a. granular
- b. blocky
- c. platy
- d. massive

19. Which of the following factors is the most important in determining time of planting?

- a. soil pH
- b. soil fertility
- c. soil aeration
- d. soil moisture

20. What is another term for rhizome:

- a. bulb
- b. horizontal underground stem
- c. crown
- d. tuber

21. To what plant family do grass crops, i. e. corn, wheat, belong to?

- a. leguminosae
- b. gramineae
- c. solanaceae
- d. cruciferae

22. Which of the following soil types would best be described as formed from organic material?

- a. Inceptisols
- b. Vertisols
- c. Histosols
- d. Vertisols

23. Which of the following characteristics is used to identify broadleaf weed seedlings?

- a. auricles
- b. cotyledons
- c. ligules
- d. pubescence

24. If a plant can exclude or overcome a disease it is considered?

- a. diverse
- b. susceptible
- c. resistant
- d. tolerant

25. A limitation of a GMO crop is:

- a. not marketable in some countries
- b. usually less yield
- c. higher seed costs
- d. require higher soil fertility

26. Which of the following characteristics are used to identify grass weed seedlings?

- a. leaf arrangement
- b. simple versus compound leaf
- c. pubescent on the cotyledons
- d. presence or absence of ligules

27. Biological control agents that work best are:

- a. indigenous to the crop
- b. indigenous to the area
- c. native populations
- d. not indigenous to the crop or area

28. What type of fungicides are designed to kill specific pests, as opposed to a wide range of pests?

- a. narrow spectrum
- b. systemic
- c. acute
- d. broad spectrum

29. This method of applying P usually results in the most available P.

- a. broadcast and disked
- b. broadcast
- c. banded
- d. top-dress

30. Which of the following pathways is of most concern for loss of phosphate from recently tilled fields?

- a. leaching
- b. runoff
- c. erosion
- d. ponding

31. In which of the following situations will more volatilization occur?

- a. dry phosphate drilled with seed wheat
- b. green manure disked in after application
- c. anhydrous ammonia shanked into fallow ground
- d. dry blended fertilizer applied on wet soil

32. The area in acres of a square field that is 1500' on each side is:

- a. 3
- b. 6
- c. 52
- d. 160

33. If a field has a 20 foot change in elevation over a distance of 1000 feet, the slope is:

- a. 0.02%
- b. 2 %
- c. .2 %
- d. 20 %

34. Which type of erosion removes a thin layer of soil?

- a. splash
- b. sheet
- c. rill
- d. gully

35. Which of the following factors affects wind erosion the least?

- a. length of slope
- b. surface roughness
- c. soil texture
- d. vegetation

36. Gluten is a term often heard when people discuss health. Gluten is actually a _____ found in grains. Gluten in wheat allows the bread dough to be _____.

- a. fat, tasty
- b. protein, elastic
- c. carbohydrate, high in calories
- d. sugar, sweet

37. The bran is the part of the wheat kernel that:

- a. is the soft inner part
- b. is embryo that would germinate
- c. is the outer shell or surface of the kernel
- d. is processed into refined flours

38. The reason nitrogen is usually deficient in soils is because it is:

- a. not very mobile
- b. a micronutrient
- c. not applied correctly
- d. highly mobile

39. As corn stubble and other plant material decompose, nutrients are released to the soil. This process is called:

- a. mineralization
- b. soil mining
- c. allelopathy
- d. immobilization

40. Seedling emergence is hindered by:

- a. plowpans
- b. surface crusting
- c. warm weather
- d. deep water tables

41. The irrigation method where water is applied at very low volumes is :

- a. wheel lines
- b. hand lines
- c. furrow
- d. drip

42. A good soil structure in the subsoil improves:

- a. germination
- b. root elongation
- c. water table levels
- d. symbiotic nitrogen fixation

43. Some weeds show herbicide resistance because:

- a. their seeds live in the soil for many years
- b. more organic farming is taking place
- c. the same herbicide has been used year after year
- d. weeds are finding ways to reproduce in different methods

44. Loess soils are deposited by:

- a. wind
- b. water
- c. glaciers
- d. equipment

45. If the terminal bud of a canola plant was damaged by a late season frost, regrowth will occur from:

- a. auxillary buds
- b. roots
- c. lateral stems
- d. trifoliate leaves

46. A seed germinates and forms a rosette in the fall. The next year this rosette grows a stem, flowers and forms a seedhead. This type of plant is best described as:

- a. an annual
- b. a winter annual
- c. a biennial
- d. a perennial

47. Economic Optimum Nitrogen rate for any crop is:

- a. the rate where the crop yield is at its maximum
- b. the rate where the last unit of N returns enough crop revenue to pay for the N
- c. applying as much N as possible until the crop lodges
- d. applying the amount of N that is stated on your soil test results

48. Soybeans respond to a poor crop stand by:

- a. tillering
- b. branching
- c. producing stolons
- d. developing auxillary buds

49. Winter wheat responds to a poor crop stand by:

- a. tillering
- b. branching
- c. producing stolons
- d. developing auxillary buds

50. In corn, stage R1, refers to:

- a. seedling emergence
- b. tasseling
- c. silking
- d. denting

Answers to 2016 National CDE Written Test

1. b
2. d
3. b
4. a
5. b
6. a
7. d
8. d
9. a
10. b
11. d
12. b
13. a
14. b
15. a
16. c
17. b
18. a
19. d
20. b
21. b
22. c
23. b
24. c
25. a
26. d
27. d
28. a
29. c
30. c
31. d
32. c
33. b
34. b
35. a
36. b
37. c
38. d
39. a
40. b
41. d
42. b

- 43. c
- 44. a
- 45. a
- 46. c
- 47. b
- 48. b
- 49. a
- 50. c