CENTRAL PLATTE NATURAL RESOURCES DISTRICT
NITROGEN MANAGEMENT CERTIFICATION TEST

NAME: **CERT #:**
ADDRESS:
CITY:

Section A: The Nitrate Contamination Concern

1) The U.S. Environmental Protection Agency's maximum contaminant level for nitrate-nitrogen in public water supplies is _____ .
   a. 5 ppm
   b. 10 ppm
   c. 15 ppm
   d. 25 ppm

2) The only illness clearly caused by drinking water with elevated nitrate levels is _____ .
   a. Hypertension in adults
   b. Birth defects of the central nervous system
   c. Methemoglobinemia (blue baby syndrome) in infants under six months of age
   d. None of the above

3) At some point, nitrate leaching occurs under all _____ fields that receive nitrogen fertilizer whether the field is irrigated or not.
   a. Soybeans
   b. Potatoes
   c. Sorghum
   d. Corn

4) Depending on the geology of the area and the depth of drainage loss, nitrate-nitrogen can reach the top of a shallow aquifer _____ .
   a. In a few days
   b. In a few weeks or months
   c. One to two years
   d. Ten to twenty years

Section B: Recent Trends in Nitrogen Fertilizer and Water Use in Irrigated Corn

5) Total Nitrogen Use Efficiency (NUE_T) is the grain or forage yield per unit of total nitrogen available to the crop. What factors does that include?
   a. Manure N, groundwater N added via irrigation, soil residual N
   b. Soil residual N, urea N, fertilizer N
   c. Fertilizer N, soil residual N, groundwater N added via irrigation
   d. Liquid formulations, urea N, groundwater N added via irrigation

6) Factors that influence Nitrogen Fertilizer Use Efficiency (NUE_F) include _____ .
   a. Depth to groundwater
   b. Crop rotation
   c. Type of irrigation
   d. B and C
   e. All of the above

Section C: Soil Characteristics That Influence Nitrogen and Water Management

7) Two of the most important characteristics of a soil profile that change across the landscape are _____ .
   a. Parent material and organic matter
   b. Clay accumulation and parent material
   c. Organic matter and the density of the clay accumulation horizon
   d. Surface residue and organic matter

8) Available water is the amount of water held by the soil between which two limits?
   a. Field capacity and field saturation
   b. Field capacity and permanent wilting point
   c. Field capacity and zero water content
   d. Saturation and permanent wilting point

9) Plant available water is determined primarily by _____ .
   a. Soil texture
   b. Average rainfall
   c. Soil structure
   d. Daytime temperatures

10) This type of soil has the greater infiltration rates than others:
   a. Clay
   b. Loam
   c. Silty
   d. Sandy

Section D: What Happens when Nitrogen is Applied to the Soil?

11) Mineralization is the process by which organic nitrogen is converted to plant available nitrogen. The two processes of mineralization include:
   a. Nitrification and immobilization
   b. Aminization and ammonification
   c. Denitrification and volatilization
   d. Fixation and nitrate leaching

12) The timing and application of nitrogen fertilizers is critical to nutrient management. There are "4R's" that are suggested for consideration in that process. Which is NOT one of the "4R's"?
   a. Right time of application
   b. Right fertilizer type
   c. Right placement
   d. Right soil type
   e. Right application rate

13) Under furrow irrigation, it is likely that nitrogen will be moved deeper in the profile during the growing season because depth of water applied with each irrigation is typically _____ than is required to refill the root zone.

a. More
b. Less
c. About the same
d. None of the above

Section E: How to Determine the Optimum Rate of Nitrogen Fertilizer

14) In order to assess soil nitrate availability, the ideal sampling depth should be _____ .

a. As deep as the effective rooting depth for the crop
b. Less than three feet
c. In the top foot of the root zone
d. Calculated based on last year's yield

15) The amount of nitrate-nitrogen in the soil is related to a combination of several management practices. Which of the following can contribute to a greater or lesser amount of residual nitrogen?

a. Previous crop
b. Past amount of commercial nitrogen applied
c. Soil organic matter
d. All of the above

16) Calculate the nitrogen fertilizer needed (lb/acre) for corn for the following:

Expected yield	180 bu/acre
Soil organic matter	1.5 percent
Soil nitrate	12.0 ppm

a. 98 lb/acre
b. 112 lb/acre
c. 117 lb/acre
d. 123 lb/acre

Section F: Giving Credit for Non-fertilizer Nitrogen Sources

17) The minimum estimated nitrogen contributed to the crop from mineralization for a soil containing 2% organic matter is _____ .

a. 10 to 20 lb/acre/yr
b. 30 to 40 lb/acre/yr
c. 40 to 55 lb/acre/yr
d. 50 to 60 lb/acre/yr
e. 60 to 70 lb/acre/yr

18) The estimated nitrogen credit for a crop following a 69% stand of alfalfa on a sandy soil is _____ .

a. 80 (lb/acre nitrogen credit)
b. 120 (lb/acre nitrogen credit)
c. 70 (lb/acre nitrogen credit)
d. 140 (lb/acre nitrogen credit)

19) Irrigation water contains 25 ppm nitrate-nitrogen. The 5-year average irrigation water application depth is 12 inches per year. Using 80% of the 5-year average, how much crop available nitrogen is in the irrigation water?

Calculate the irrigation water nitrogen credit.

a. 52.4 lb of nitrogen/acre
b. 54.4 lb of nitrogen/acre
c. 57.6 lb of nitrogen/acre
d. 69.0 lb of nitrogen/acre

Section G: How to Properly Apply Nitrogen Fertilizer

20) The potential for leaching of nitrate by rainfall is highest in the _____ .

a. Spring
b. Summer
c. Mid-summer during rapid nitrate uptake
d. Fall

21) Grain or forage yield per unit of nitrogen available to the crop is called _____ .

a. Fertilizer demand
b. Nitrogen use ratio
c. Nitrogen factor
d. Nitrogen use efficiency

22) For a sandy soils, the best choice for nitrogen fertilizer timing is _____ .

a. Apply all the nitrogen before planting
b. To apply most nitrogen prior to planting, with a small amount side dressed
c. To use a small amount of nitrogen as a starter, with the remainder side dressed or applied with a sprinkler irrigation system
d. None of the above

23) The nitrogen use efficiency for fall-applied nitrogen is _____ compared to side-dress applied nitrogen.

a. Lower
b. Higher
c. The same as
d. None of the above

Section H: Nebraska Irrigation Water Resources Management

24) The return of water to the atmosphere as water vapor is referred to as _____ .

a. Transpiration
b. Evaporation
c. Evapotranspiration
d. Recharge

25) What is NOT considered a beneficial use of consumptive water use?
   a. Increases crop yield
   b. Evapotranspiration from weeds in road ditches
   c. Production of electrical energy
   d. Increases recreation at lakes

26) From a farmer's perspective, what are considered losses of water?
   a. Runoff
   b. Evaporation from storage
   c. Reduced tillage contributing to higher infiltration rates
   d. A and B
   e. All of the above

27) Intentional stressing of the crop at certain crop stages to reduce water use while minimizing yield reduction is _____ .
   a. Furrow irrigation
   b. Surge irrigation
   c. Deficit irrigation
   d. Sprinkler irrigation

Section I: Understanding Crop Water Use

28) Crop water use is made up of what two parts?
   a. Condensation and evaporation
   b. Evaporation and transpiration
   c. Evaporation and precipitation
   d. Percolation and transpiration

29) Over a growing season, the majority of evapotranspiration (ET) is from
   a. Evaporation
   b. Transpiration from the leaves
   c. Equal amounts of evaporation and transpiration
   d. The middle third of the root zone

30) Factors that affect ET rates are _____ .
   a. Air temperature
   b. Solar radiation
   c. Wind speeds
   d. All of the above

31) What can have a significant effect on the evaporation of water from the soil surface at the end of the growing season?
   a. Crop residue
   b. Crop type
   c. Snow fall
   d. Herbivores

Section J: Irrigation Management for Water Quality Protection

32) Components of water application efficiency do NOT include:
   a. Net irrigation depth
   b. Gross Irrigation depth
   c. Amount of nitrogen applied
   d. Root zone

33) The total volume applied to an irrigated area is calculated by multiplying _____ .
   a. Flow rate and irrigation time
   b. Irrigation time and area irrigated
   c. Flow rate and area irrigated
   d. Flow rate and the net application factor

34) Determine the gross irrigation depth for one revolution from the following center pivot irrigation information.

A center pivot irrigates 132 acres with a well that pumps 750 gpm. A revolution is made in 72 hours.

   a. .8 inches
   b. .9 inches
   c. 1.0 inches
   d. 1.1 inches

35) Irrigation should be scheduled so that the plant's available soil water content remains above _____ of the total available water-holding capacity.
   a. 20%
   b. 30%
   c. 40%
   d. 50%

36) A minimum of _____ depths are required to properly represent root zone moisture conditions.
   a. One
   b. Two
   c. Three
   d. Four

Section K: Irrigation Water Management for Furrow Irrigation

37) Which does NOT influence how quickly water advances down the furrow?
   a. Soil texture
   b. Slope
   c. Soil temperature
   d. Surface conditions

38) The _____ has a direct impact, not only on how fast water advances down the field, but more importantly, on the total amount of water applied.
   a. Advance time
   b. Set time
   c. Stream size
   d. Set size

39) To apply water uniformly and efficiently, surface irrigators must be willing to change _____ so that water advances down the field rapidly.
   a. Set size
   b. Stream size
   c. Set time
   d. Both B and C

Section L: Irrigation Water Management for Sprinkler irrigation

40) System capacity considerations are influenced by _____ .
   a. Soil texture
   b. Crop water requirements
   c. Rainfall potential
   d. All of the above

41) Sprinkler uniformity is NOT influenced by _____ .
   a. Sprinkler type
   b. Nitrogen applied
   c. Nozzle placing
   d. Wetted diameter of the sprinkler

42) The best way to reduce runoff during the irrigation season is to _____ .
   a. Monitor weather conditions
   b. Apply all of nitrogen in spring
   c. Reposition the nozzle along the system
   d. Control depth of application

43) Peak evapotranspiration is the greatest daily rate of water use that is expected by a crop over a series of _____ days.
   a. One to two
   b. Two to three
   c. Three to five
   d. Four to five

Section M: Irrigation Water Management for Subsurface Drip Irrigation

44) What type of permit is required before a SDI system can be installed?
   a. Groundwater transfer
   b. Underground injection
   c. Surface water transfer
   d. Well drillers

45) Some advantages to subsurface drip irrigation are _____ .
   a. Soil surface is not wetted
   b. Small application depths
   c. Both A and B
   d. Neither A or B

46) What is NOT a disadvantage of subsurface drip irrigation?
   a. Rodent damage
   b. Emitters become clogged
   c. Deep percolation loss
   d. Runoff

Central Platte NRD's Rules and Regulations

47) How early can commercial nitrogen fertilizer be applied in Central Platte NRD's Phase II/III Quality Management Area? _____
   a. After November 1st
   b. When ground temperature is below 50 degrees
   c. After March 1st
   d. Anytime after harvest

48) A soils analysis must be submitted in Central Platte NRD's Phase II/III Quality Management Area: _____
   a. For each field or 80 acre tract growing corn, sorghum or potatoes
   b. A composite sample must consist of a mixture from no less than one three-foot probe every five acres
   c. Only shallow samples are required
   d. A and B
   e. A and C

49) To report corn, sorghum and potatoes on district forms, it should include: _____
   a. Test results from residual soil and water analysis
   b. Expected yields
   c. Credits for past legume crop and manure or sludge
   d. All of the above
   e. None of the above

50) Commercial nitrogen fertilizer can be applied to corn or sorghum in a Phase III area of Central Platte NRD's Quality Management Area _____
   a. All applied as pre-plant/pre-emergent if the total application for the year is less than 80 pounds
   b. All applied as pre-plant/pre-emergent if the total application for the year is more than 80 pounds if an approved inhibitor is used
   c. Split applied without an inhibitor if the majority of the fertilizer is applied as side dress/post-emergent.
   d. All of the above