2018 Nursery Landscape General Knowledge Exam

Each Question 6 pts. (240 pts. total)

1. In landscapes where the soil has become compacted, oxygen levels can be increased by the use of a(n):
A. air spade
B. thatcher
C. aerator
D. water spade

2. Many landscape equipment engines require a little extra fuel in the carburetor to start. Most models use a(n) _____ to supply the extra fuel for starting.
A. exhaust valve or flywheel
B. primer bulb or choke
C. fuel cell or fuel slide
D. cylinder or fuel ring

3. Two of the most pressing current issues impacting the landscape maintenance industry include:
A. emerald ash borer and Japanese beetles
B. turf decline and herbicide resistance
C. emissions and noise pollution
D. power blower and string trimmer safety

4. Plant containers in the nursery trade are generally measured by the:
A. liter
B. height
C. circumference
D. gallon

5. A method used to measure the acute oral and dermal toxicities of pesticides is called:
A. Insecticide Tolerance Dosage (ITD)
B. LD50
C. 2,4-D25
D. Toxicology Dose (TD)

6. What is the safest time to prune a tree in terms of disease control:
A. December
B. June
C. August
D. July

7. Which nutrient is most responsible for excessive algae growth in lakes:
A. Potassium
B. Boron
C. Manganese
D. Phosphorus

8. When planting a tree or shrub it is best to plant with the root flare:
A. At the soil surface
B. Below the soil surface
C. Far below the soil surface
D. Above the soil surface.

9. As pH increases from 6 to 8 in the soil what elements are likely lacking in the plant:
A. Ca and Mg
B. Mg and Mn
C. Mn and Fe
D. Fe and Ca

10. Phototropism refers to ...
A. plants dying from too much light
B. how much light a plant uses within a period of time
C. the bending of plants toward a more intense light
D. photographing plants

11. _____ is a natural phenomenon in which one plant secretes chemicals that inhibit root growth or seed germination of other seeds.
A. Allelopathy
B. Apical dominance
C. Biological control
D. Pheromone effect

12. What weed is normally controlled with a pre-emergent herbicide?
A. Canada thistle
B. Dandelion
C. Quack grass
D. Crabgrass

13. Which cool season turfgrass is the most salt tolerant?

A. Centipede grass

B. Kentucky Bluegrass

C. Perennial Ryegrass

D. Fine fescue

14. Dicamba is a widely used herbicide for broadleaf weed control in the turf and landscape industry. There are growing concerns about improper use because of the damage it causes on desirable landscape plants. Which of the following plants would Dicamba not cause any damage to?

A. Ash

B. White Pine

C. Kentucky Bluegrass

D. American Linden

15. The terms triploid, diploid, and haploid, refer to the:

A. Number of flowers per stem

B. Formation of leaves

C. Number of bud breaks expected after pruning

D. Number of chromosomes

16. Recommended cutting height for a lawn with a bluegrass/ryegrass mixture is:

A. 1 to 2 inches

B. 0.75 to 1.5 inches

C. 1.5 to 2.5 inches

D. 3 to 4 inches

17. You purchase a home that has an irrigation system with 6 stations. Each station has 4 heads that emit 0.25 gallons per minute per head. If each zone runs for 30 minutes how many gallons of water will your system use during the entire cycle?

A. 24

B. 180

C. 96

D. 2,880

18. 50 pounds of 3-9-18 fertilizer has _____ lbs. N, ____ lbs. P, _____ lbs. K.

A. 1.5; 4.5; 9

B. 3; 9; 18

C. 15; 45; 90

D. 150; 450; 900

19. In what stage of their metamorphosis does an insect not feed and is primarily inactive?

A. pupa

B. larva

C. nymph

D. maggot

20. Which word correctly identifies the process of mechanically breaking the seedcoat of a seed to aid in germination?

A. Scarification

B. Stratification

C. Scratching

D. Fracking

21. Planting a tree too deep can cause this, which over time can cause increased susceptibility to storm damage and overall health:

A. Root loss

B. Stem girdling roots

C. Ingrown roots

D. Root hairs

22. Plants maintain a healthy heat and moisture balance through _____.

A. photosynthesis

B. respiration

C. hybridization

D. transpiration

23. Any irrigation system installed after 2003 is required by law to have this device installed and operable:

A. Valve

B. Vacuum breaker

C. Solenoid

D. Rain sensor

24. The _____ is the sticky upper portion of the pistil that collects and holds pollen.

A. anther

B. stigma

C. style

D. filament

25. Natural soil is arranged in layers referred to as _____.

A. soil horizons

B. soil rings

C. soil texture

D. sand, silt and clay

26. A residential landscape can be divided into different categories of use – public area, family living area and _____ area.

A. construction

B. service

C. cropping

D. aesthetic

27. A retaining wall higher than 3 feet must be engineered.

A. True

B. False

28. What part of the leaf opens and closes the stoma?

A. Guard Cells

B. Leafididimus

C. Epidermis

D. Petiole

29. A method of establishing turf in which a mixture of seed, water, fertilizer and a soil stabilizer is sprayed onto the soil is called:

A. hydroponics

B. hydroseeding

C. aquaseeding

D. ammonium nitration

30. The process of growing plants in a symbiotic relationship with fish is called:

A. fish farm

B. aquaculture

C. Tank farming

D. Olericulture

31. The major reasons for the wide use of double poly for Minnesota greenhouse coverings are:

A. Cost and thermal insulation value

B. Availability and variety of sizes

C. Flexibility and lasting qualities

D. Light diffusion and durability

32. The amount of water which the soil can hold against the pull of gravity is called:

A. available water

B. field capacity

C. soil moisture tension

D. osmotic water

33. Which of the following plants would you most likely use in a rain garden?

A. Purple coneflower

B. Pachysandra

C. Kentucky bluegrass

D. Dropmore honeysuckle

34. What profession below requires the greatest number of years of schooling?

A. Landscape architect

B. Landscape designer

C. Nursery manager

D. Golf course superintendent

35. Your neighbor has a creeping charlie problem in their lawn. What herbicide would you recommend to them for eradicating it and not their lawn?

A. Roundup

B. Triclopyr

C. Sedge Hammer

D. Fusilade

36. Apple scab, caused by the _____ *Venturia inaequalis*, occurs on apples and crabapples

A. bacteria

B. fungus

C. insect

D. virus

37. The best suited tree for an urban boulevard would be:

A. Ginkgo

B. Crabapple

C. Sugar Maple

D. Weeping willow

38. A _____ is a point along the stem where leaves or other stems are attached.

A. terminal bud

B. axillary bud

C. lenticel

D. bud scale

39. What would be a typical mowing height for a green on a golf course?

A. 0.125"

B. 0.5"

C. 0.25"

D. 1.2"

40. What mixing ratio of gas to oil for a two stroke engine is ideal?

A. 27:1

B. 35:1

C. 50:1

D. 65:1

Key

1. A
2. B
3. A
4. D
5. B
6. A
7. D
8. A
9. A
10. C
11. A
12. D
13. D
14. C
15. D
16. D
17. B
18. A
19. A
20. A
21. B
22. D
23. D
24. B
25. A
26. B
27. A
28. A
29. B
30. B
31. A
32. B
33. A
34. A
35. B

36. B
37. A
38. B
39. A
40. C

2018 Minnesota FFA Nursery-Landscape CDE

Problem Solving - 70 pts.

1. For a landscape renovation project in your backyard you will need to remove the existing Kentucky bluegrass in an area that measures 595 ft^2. The recommendation is to use a non-selective herbicide containing glyphosate. The recommended rate for cool season grass control is 5 fl.oz. per gallon of water. How many fluid ounces of herbicide will be needed for the given area if 10 gallons of solution will treat an acre?

A. 50 fl.oz.
B. 5 fl.oz.
C. 0.45 fl.oz.
D. 0.68 fl.oz.

2. A new client wants to hire you to clear an old pasture (17 acres) using an herbicide containing glyphosate to prepare for a prairie restoration. The neglected pasture has been unmaintained for many years and has been overrun by many weeds including Canada thistle. Using the specimen label in **Figure 1**, determine the number of gallons of herbicide required when using the **maximum** broadcast rate of application (quarts of herbicide), **maximum** volume of application (gallons of water) and total amount of **active ingredient** (pounds of potassium salt form of glyphosate) applied.

Round up to the nearest half gallon and half pound for your answers.

one gallon = 4 quarts

A. 6.5 gallons of herbicide, 51 gallons of water, 36 pounds of glyphosate (potassium salt)
B. 8.5 gallons of herbicide, 680 gallons of water, 47 pounds of glyphosate (potassium salt)
C. 8.5 gallons of herbicide, 68 gallons of water, 38.5 pounds of glyphosate (potassium salt)
D. 8.5 gallons of herbicide, 51 gallons of water, 47 pounds of glyphosate (potassium salt)

3. You have been hired to install new sod in an outdoor play area at local child care center. The customer definitely wants to you to install sod in the light grey area (22 ft x 14 ft) but would also like a quote for another, adjacent dark grey area (11 ft x 13 ft) (**Figure 2**). Calculate the **approximate** number of rolls of sod required to complete each area. Sod rolls are 18 in x 36 in, please include 10% for waste in your calculations and round up to the nearest roll.

A. 76 rolls + 35 rolls = 111 total rolls
B. 55 rolls + 45 rolls = 100 total rolls
C. 67 rolls + 35 rolls = 102 total rolls
D. 45 rolls + 35 rolls = 80 total rolls

4. Your client decides to hire you to lay sod in both areas. Calculate your cost and the cost charged to the homeowner for installation of both areas. Wholesale cost per roll is $2.00. Your installed cost is $6.00 per roll.

A. Your cost = $220.00; homeowner cost = $660.00
B. Your cost = $204.00; homeowner cost = $612.00
C. Your cost = $222.00; homeowner cost = $666.00
D. Your cost = $160.00; homeowner cost = $480.00

5. After a recent storm your company has been contracted to cut and remove trees in the area. The scope of work will include climbing, rigging, bucking, and chipping. Given the scope of work described, choose the answer that includes the proper PPE required for the optimal safety of the crew.

A. Sunglasses, gloves, hard hat
B. Chainsaw protective chaps, safety glasses, gloves, hard hat, steel toe boots
C. Chainsaw protective chaps, gloves, hard hat, steel toe boots
D. Whatever is in the work truck

6. You have been hired to develop an urban forest management plan for a community in southern Minnesota. One of your first tasks is to perform a thorough inspection of all public ash trees (*Fraxinus* spp.) for signs and/or symptoms of emerald ash borer (EAB) infestation. One of your licensed Minnesota Tree Inspectors performing the inspection has a question about the best way to describe EAB signs to an interested homeowner. Select the best description below.

A. Round adult exit holes in the bark, vertical larval galleries when bark is removed
B. D-shaped adult exit holes in the bar, horizontal larval galleries when bark is removed
C. Round adult exit holes in the bark, serpentine larval galleries when bark is removed
D. D-shaped adult exit holes in the bark, serpentine larval galleries when bark is removed

7. Your community has given residents the option to treat ash trees for protection against emerald ash borer (EAB). One of the residents has a mature green ash (*Fraxinus pennsylvanica*) providing key shade on the southwest corner of her property and has asked you for an approximate cost. You forgot your diameter tape that day but were able to measure the circumference of the tree at 4.5 ft above the ground using your regular tape measure and found that to be almost 106.8 in. One of the local tree care companies that is licensed for tree care in your community injects 10mL of emamectin benzoate per **diameter inch** and charges $7.50 per **diameter inch**. After computing diameter at breast height (DBH), round up to the nearest whole inch when making your cost calculations.

diameter = circumference / π
π = 3.14159

What price should you quote the resident?

A. $205.00
B. $801.00
C. $255.00
D. $802.50

Figure 1. Herbicide Label

Ingredients

ACTIVE INGREDIENT:
*Glyphosate, N-(phosphonomethyl)glycine,
in the form of its potassium salt..... 48.8%
OTHER INGREDIENTS:..... 51.2%
100.0%

*Contains 660 grams of the active ingredient glyphosate, in the form of its potassium salt, per liter or 5.5 pounds per U.S. gallon, which is equivalent to 540 grams of the acid, glyphosate, per liter or 4.5 pounds per U.S. gallon (39.8% by weight).

Rate Table

Weed Species	Broadcast Rate (quarts/acre)	Water Volume (gallons/acre)	Handheld Sprayer Concentration (% Solution)
Thistle, Canada	1.5 – 2	3 – 40	1.5%

Apply when most plants are at or beyond the bud stage of growth. After harvest, mowing or tillage in late summer or fall, allow a minimum of 4 weeks for initiation of active growth and rosette development prior to application of this product. Fall application must be made before a killing frost.

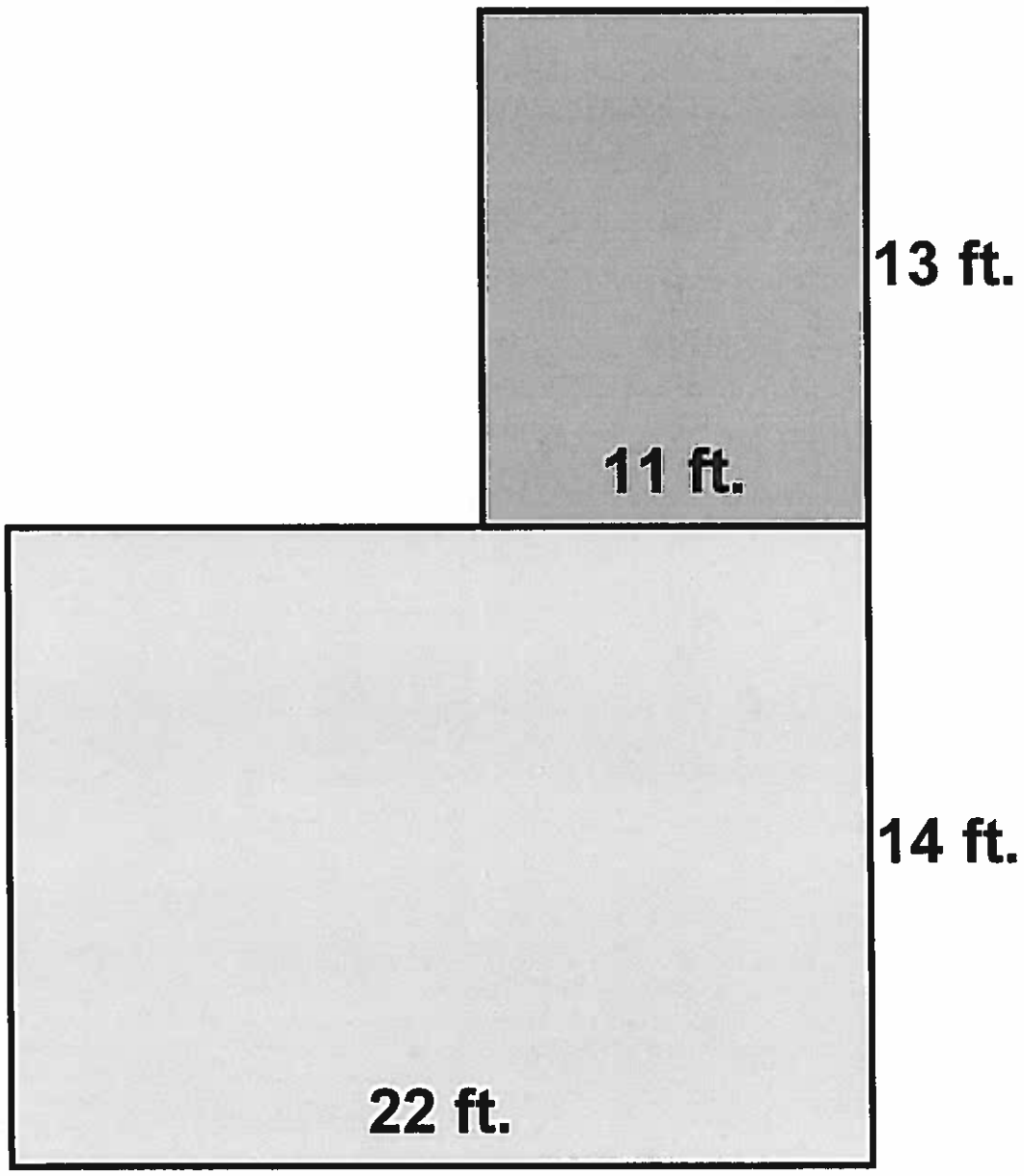
For suppression in the spring, apply 22 fluid ounces of this product alone, or 11 fluid ounces of this product plus 0.5 pound of 2,4-D, in 3 to 10 gallons of water per acre when rosette is a minimum of 6 inches in diameter. Application may be made as long as leaves are still green and plants are actively growing.

Spray Solution

Desired Volume	0.4%	0.7%	1%	1.5%	4%	7%
1 gal	0.5 oz	1 oz	1.3 oz	2 oz	5 oz	9 oz
25 gal	0.8 pt	0.7 qt	1 qt	1.5 qt	4 qt	7 qt
100 gal	1.6 qt	2.8 qt	1 gal	1.5 gal	4 gal	7 gal

2 tablespoons = 1 fluid ounce

Figure 2. Areas for Sod Installation



Key

1. D
2. B
3. A
4. C
5. B
6. D
7. C

2018 Minnesota FFA Nursery-Landscape CDE

Retaining Wall Practicum - 50 pts.

Determine the amount of materials (blocks) or costs associated with the installation of two block walls described below

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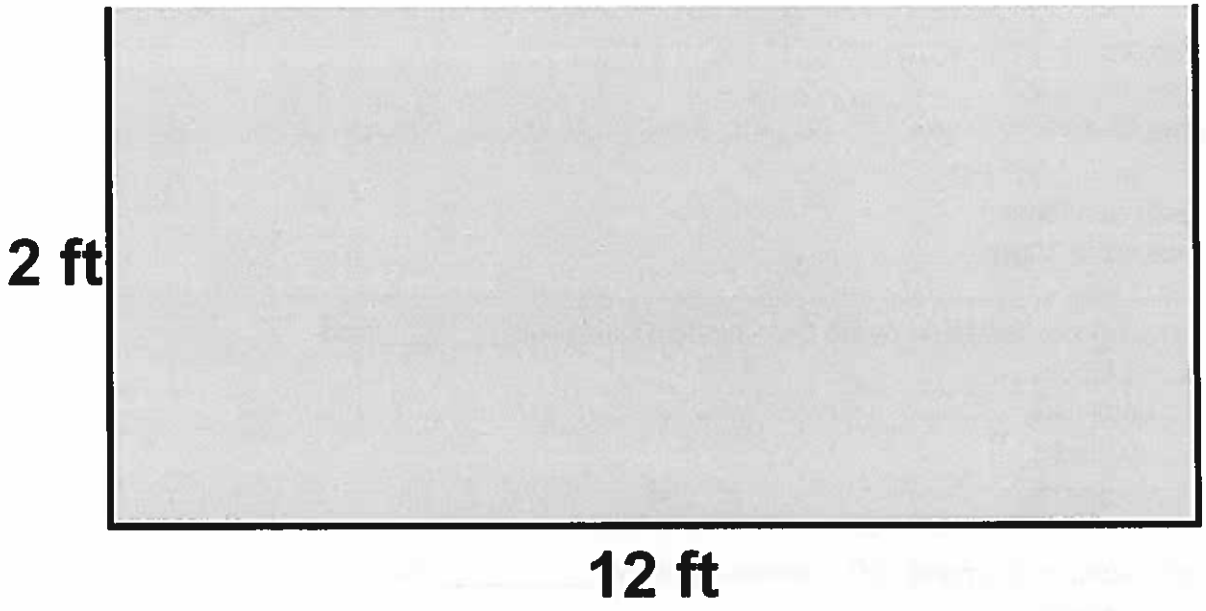
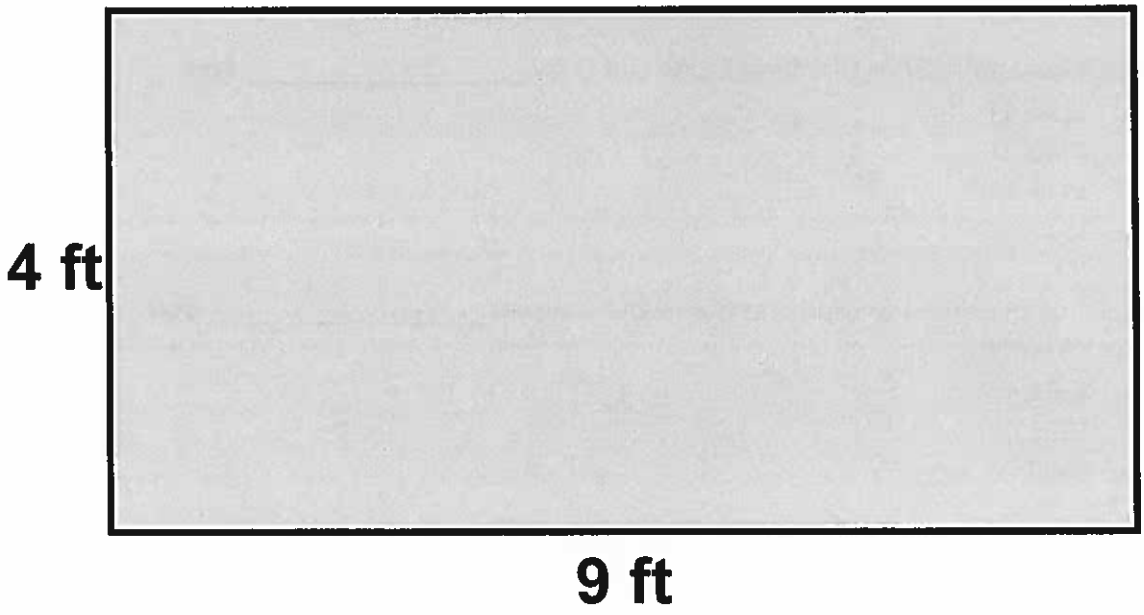
Wall 1 - Retaining Wall with Three Sides, Height = 3 ft.



Wall 2 - Raised Bed with Four Sides, Height = 1.5 ft



Assume the underlayment is in place and the retaining wall blocks will start at ground level. If partial blocks are needed use only one part of a block - DO NOT SPLIT IN HALF AND USE BOTH HALVES. For this problem do not stagger the blocks in the wall, the wall will be one block deep.

Anchor Diamond 10D (6"H x 17 3/4"W x 10"D)
Grey $5.99
Colored $6.69

Anchor Diamond Stone Cut (6"H x 17 3/8"W x 12"D)
Grey $6.29
Colored $7.79

6 questions at 5pts.
2 questions at 10pts.

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1. Wall 1 Anchor Diamond Stone Cut - number of blocks _____ 5pts.
   A. 63 blocks
   B. 66 blocks
   C. 60 blocks
   D. 36 blocks

2. Wall 2 Anchor Diamond 10D - number of blocks _____ 5pts.
   A. 63 blocks
   B. 66 blocks
   C. 132 blocks
   D. 56 blocks

3. Wall 1 cost for Anchor Diamond Stone Cut Grey _____ 5pts.
   A. $226.44
   B. $396.27
   C. $415.14
   D. $377.40

4. Wall 1 cost for Anchor Diamond Stone Cut Colored _____ 5pts.
   A. $514.14
   B. $504.45
   C. $555.45
   D. $490.77

5. Wall 2 cost for Anchor Diamond 10D Grey _____ 5pts.

A. $437.77
B. $377.37
C. $337.77
D. $357.37

6. Wall 2 cost for Anchor Diamond 10D Colored _____ 5pts.

A. $421.47
B. $447.21
C. $407.47
D. $474.47

7. It takes a crew of 4 laborers with a skid loader 4 hours to excavate the area, 2 hours to prep the base and 6 hours to install the block for **Wall 1**. The hourly rate for one laborer is $38.00, the hourly rate for the skid loader is $60.00.

Including labor, equipment and materials cost using the Anchor Diamond Stone colored block what will be the total cost to install **Wall 1**? _____ 10pts.

A. $3,085.14
B. $3,508.14
C. $3,058.14
D. $3,805.14

8. It takes a crew of 4 laborers with a skid loader 6 hours to excavate the area, 3 hours to prep the base and 10 hours to install the block for **Wall 2**. The hourly rate for one laborer is $38.00, the hourly rate for the skid loader is $60.00.

Including labor, equipment and materials cost using the Anchor Diamond 10D colored block what will be the total cost to install **Wall 2**? _____ 10pts.

A. $4,494.47
B. $9,444.47
C. $4,744.97
D. $4,449.47

Answer Key

1. 12'+2'+2'=16'
   Each block is 6" high so 3' high wall will need 6 courses. 16'/1.45' per block = 11.03 (11) blocks per course x 6 courses = **66 blocks**

2. 9'+9'+4'+4'=30'
   Each block is 6" high so 1.5' high wall will need 3 courses. 30'/1.48' per block = 20.3 (21) blocks per course x 3 courses = **63 blocks**

3. 66 blocks x $6.29 = **$415.14**

4. 66 x $7.79 = **$514.14**

5. 63 x $5.99 = **$377.37**

6. 63 x $6.69 = **$421.47**

7. 4+2+6 = 12 hours x 4 laborers = 48 hours x $38.00 = $1,824.00
   12 hours x $60.00 = $720.00
   $1,824.00 + $720.00 + $514.14 = **$3,058.14**

8. 6+3+10 = 19 hours x 4 laborers = 76 hours x $38.00 = $2,888.00
   19 hours x $60.00 = $1,140.00
   $2,888.00 + $1,140.00 + $421.47 = **$4,449.47**

Key

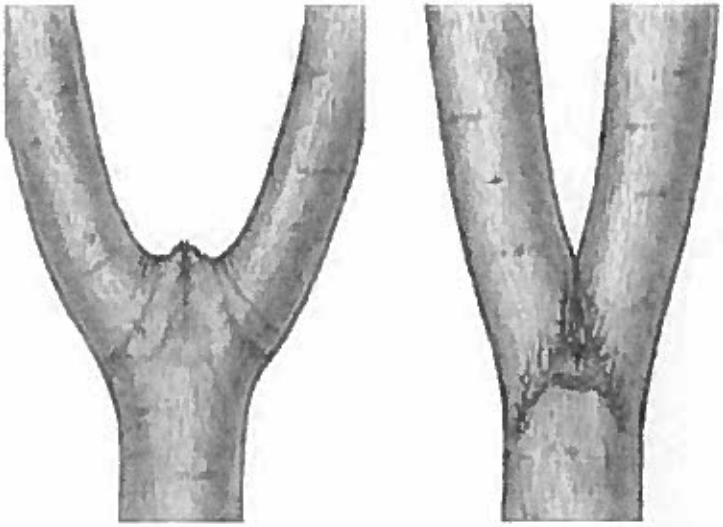
1. B
2. A
3. C
4. A
5. B
6. A
7. C
8. D

2018 Minnesota FFA Nursery-Landscape CDE

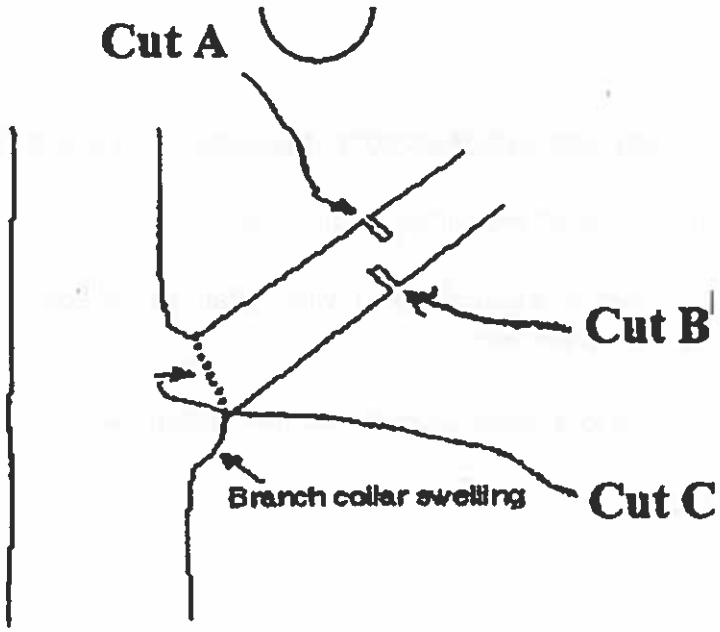
Nursery & Landscape Stock Pruning Practicum - 50 pts.

1.Which diagram illustrates a structurally sound branch? 3 pts.

A B

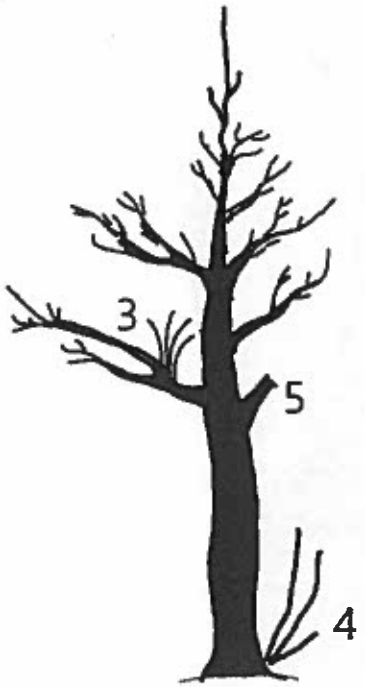


2. Write the correct order of cuts made when removing a 2 in. branch from a sugar maple (*Acer saccharum*) 3 pts.



A. C, A, B
B. B, C, A
C. B, A, C
D. A, B, C

Match each condition with the correct location on the tree - 3 pts. each



A. Water Sprout
B. Sucker Growth
C. Branch Stub

Match each pruning cut type with the correct description - 3 pts. each

6. Removing a branch to parent limb of larger diameter.

7. Removing a branch back to a lateral branch with a diameter at least ⅓ of the parent limb, ideally ½ diameter of the parent limb.

8. Removing branch back to a lateral branch less than ⅓ diameter of parent or to a node.

A. Reduction Cut
B. Thinning Cut
C. Heading Cut

Choose a group for each plant given the descriptions below - 2 pts. each

Choose only one group per plant.

Group A - Shrubs grown for their foliage should be pruned in spring before growth begins.

Group B - Plants that bloom early in the growing season on last year's branches. Prune these plants immediately after blossoming.

Group C - Plants with free-flowing sap that often "bleeds" after pruning in late winter. Prune these plants later in spring or early summer to avoid.

Group D - Plants that should be pruned in late winter to avoid disease transmission

	Group A	Group B	Group C	Group D
9. Azalea				
10. Common Lilac				
11. Dogwood				
12. Forsythia				
13. Fragrant Sumac				
14. Honeysuckle				
15. Japanese Barberry				
16. Northern Pin Oak				
17. Norway Maple				
18. Mountain Ash				
19. Red Oak				
20. Sugar Maple				
21. Winged Euonymus				

Key:

1. A
2. C
3. A
4. B
5. C
6. B
7. A
8. C
9. B
10. B
11. A
12. B
13. A
14. A
15. A
16. D
17. C
18. D
19. D
20. C
21. A