

2019 University of Minnesota FFA Invitational General Knowledge Exam

40 Questions (6 pts./question)

1. The industry standard for stair construction is a ____ inch rise and a ____ inch tread depth.
 - A. 6.5, 10.5
 - B. 7, 11
 - C. 6, 11
 - D. 7.5, 12
2. One of the differences between a 2-cycle engine and a 4-cycle engine is that a 2-cycle engine must have:
 - A. A carburetor
 - B. A spark arrestor
 - C. Oil mixed with fuel
 - D. A spark plug
3. Which fertilizer analysis would promote seed establishment the best?
 - A. 24-0-6
 - B. 16-0-4
 - C. 12-12-12
 - D. 18-46-0
3. The genus of Basswood/Linden trees is:
 - A. *Acer*
 - B. *Gymnocladus*
 - C. *Syringa*
 - D. *Tilia*
4. Which commonly used landscape plant is registered as an invasive species in Minnesota?
 - A. Common lilac
 - B. Amur maple
 - C. Autumn Blaze maple
 - D. Red-twigged dogwood

5. Which of the following propagation methods usually produces the greatest amount of genetic variation in the offspring?
- A. Layering
 - B. Tissue culture
 - C. Seeds
 - D. Division
6. The best control method for Creeping Charlie in a turf area is:
- A. Mowing to a height of 1.5"
 - B. Spraying with Triclopyr
 - C. Spraying with Glyphosate
 - D. Spraying with a salt solution
7. Arborvitae shrubs planted in a boulevard that display brown needles in the spring most likely have been affected by _____.
- A. Salt spray
 - B. Herbicide damage
 - C. Excessive phosphorus
 - D. Deer urine
8. The female sexual reproductive parts of a plant include the:
- A. Filament, anther, and stamen
 - B. Ovary, style, and stigma
 - C. Sepal, ovule, and anther
 - D. Receptacle, style, and filament
9. Research has proven that the insecticide _____ is fatal to honey bees when ingested through plant parts.
- A. Orthene
 - B. Neem oil
 - C. Imidacloprid
 - D. Pyrethrum
10. The use of a mass planting of Dwarf Korean Lilacs on both sides of a building entrance is practicing this principle of design:
- A. Focalization of interest
 - B. Balance
 - C. Unity
 - D. Rhythm and Line

11. A Dahlia plant has a _____ food storage structure and is propagated by way of _____.

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- B. Rhizome, division
- C. Bulb, chipping
- D. Tuber, dividing

12. The installation of a brick patio requires crushed rock with fines to provide a solid base for the bricks. How would you estimate the number of cubic yards of base material needed?

- A. Calculate the square footage of the area, divide by 27 and add 10% for settling.
- B. Calculate the square footage of the area, divide by 9 and add 10% for settling.
- C. Calculate the square footage of the area, multiply by 27 and add 10% for settling
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13. Which greenhouse glazing material has the highest light transmittance?

- A. Single layer glass
- B. Polyethylene film
- C. Fiberglass reinforced polyester
- D. Double layer glass

14. The pressure in an irrigation system when the water is not flowing is known as the:

- A. Surge pressure
- B. Dynamic pressure
- C. Standing pressure
- D. Static pressure

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

- A. soil horizons
- B. soil rings
- C. soil textures
- D. sand, silt and clay

16. The turf species that tolerates foot traffic the most is:
- A. Fine fescue
 - B. Tall fescue
 - C. Kentucky bluegrass
 - D. Rough bluegrass
17. The term "whip" would most properly refer to which of the following?
- A. Young, unbranched seedling trees
 - B. Rooted ivy cuttings
 - C. A landscaping tool
 - D. The regrowth of Ninebark after it has been cut to the ground
18. What part of the leaf opens and closes the stoma allowing the plant to breathe, transpire, give off moisture and exchange gases?
- A. guard cells
 - B. epidermis
 - C. xylem
 - D. petiole
19. The proper PPE for operating a chainsaw is:
- A. Chaps, ear protection, and saddle
 - B. Sun glasses, chaps, and safety vest
 - C. Safety glasses, ear protection, and safety vest
 - D. Safety glasses, chainsaw protective chaps, and ear protection
20. Greasing a machine weekly is an example of _____ maintenance:
- A. general
 - B. safety
 - C. periodic
 - D. preventative
21. A residential landscape can be divided into different categories of use; public area, family living area and _____ area.
- A. construction
 - B. service
 - C. gardening
 - D. aesthetic

22. When planting a tree it is important to ensure that it is not planted too deep in order to prevent:
- A. root loss
 - B. transplant shock
 - C. stem girdling roots
 - D. co-dominant leaders
23. A granular pre-emergent herbicide that will effectively prevent weed weed germination yet allow grass seed to germinate is:
- A. Mesotrione
 - B. Prodiamine
 - C. Trifluralin
 - D. Dithiopyr
24. When pesticides have been applied in a greenhouse, an REI number is indicated near the entry area. REI is an acronym for:
- A. Re-entry interval
 - B. An outdoor store
 - C. Registered endophyte incidence
 - D. Remnants entry indicator
25. A _____ must be installed on an irrigation system to prevent water from re-entering into the water source.
- A. Solenoid
 - B. Master valve
 - C. Isolation valve
 - D. Vacuum breaker
26. A plant with two or more leaves at the same node which wrap around the stem or petiole are called:
- A. Alternate
 - B. Whorled
 - C. Alternate
 - D. Sub-opposite

27. The influence of gravity which causes roots to grow down into a soil is known as:
- A. Phototropism
 - B. Gravitational pull
 - C. Subterranean pull
 - D. Geotropism
28. When pruning a scaffold branch that will remain on the tree until future removal, a _____ cut is made to suppress growth.
- A. thinning
 - B. reduction
 - C. rejuvenation
 - D. topping
29. A layer of partially decomposed stems, roots, and leaves of grass which develops above the soil surface in a turf area is called:
- A. mulch
 - B. thatch
 - C. rhizomes
 - D. mineral matter
30. Which type of mower would be used to mow a tee box on a golf course?
- A. reel mower
 - B. flail mower
 - C. rotary mower
 - D. sickle mower
31. Scientists that study and research fruiting plants are called:
- A. botanists
 - B. viticulturists
 - C. olericulturists
 - D. pomologists

32. A broadleaf weed that emerges in early spring, is an annual weed, can be found along sidewalk edges and poorly managed turf, has dull blue-green, oblong leaves, and is prostrate can be identified as:
- A. dandelion
 - B. chickweed
 - C. clover
 - D. knotweed
33. A construction site must prevent water from leaving a site to reduce sediment from entering waterways. Examples of procedures that will aid in reducing runoff include:
- A. installing a silt fence perimeter and bio-logs around catch basins
 - B. installing a silt fence at the site entrance and using a sump pump
 - C. using a sump pump and plugging the catch basins
 - D. installing a drain tile and digging a trench
34. When calibrating a fertilizer/herbicide/salt spreader you should:
- A. use the manufacturer's recommended setting
 - B. use the exact same product you will be applying
 - C. find any area that needs to be treated
 - D. operate the spreader until the excess runs out
35. Which of the following nutrients are classified as micro nutrients?
- A. Nitrogen, Carbon
 - B. Phosphorus, Sulfur
 - C. Iron, Manganese
 - D. Calcium, Magnesium
36. Minnesota is located in what three plant hardiness zones?
- A. 4,5,6
 - B. 3,4,6
 - C. 2,3,4
 - D. 3,4,5
37. Monocot stems have the xylem and phloem that are:
- A. one each side of the cambium layer
 - B. in small bundles scattered through the stem
 - C. side by side
 - D. near the outside of the stems

38. The term used to describe landscaping techniques that conserve water is:

- A. Xeriscaping
- B. Conserviscaping
- C. Aridscaping
- D. Instascaping

39. A client is concerned with their older Hackberry; there are several small, round, light green, lesions protruding from the leaves. What are they and will kill the tree?

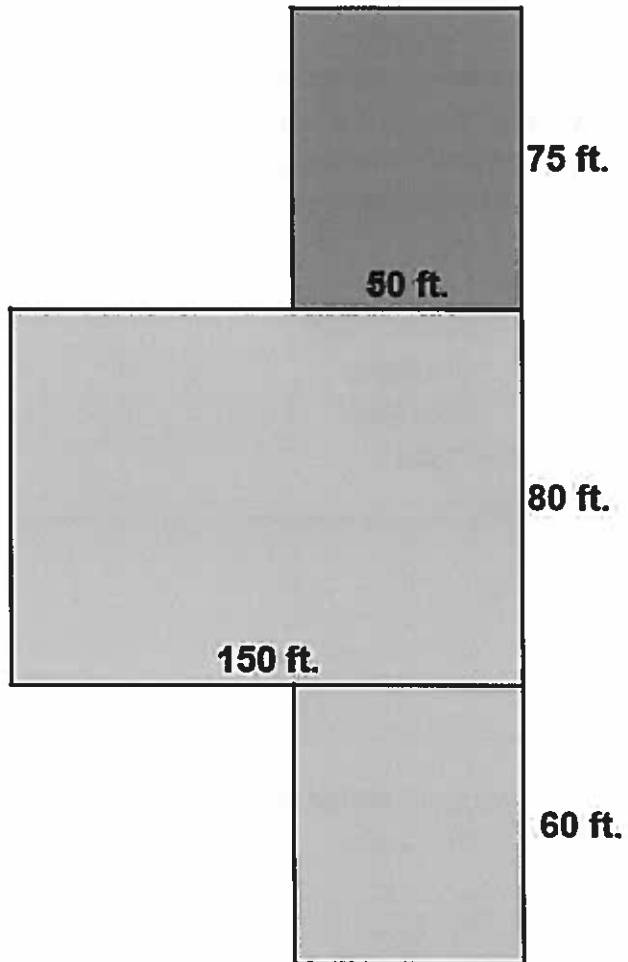
- A. Leaf galls, the tree will be fine
- B. Canker, the tree will decline
- C. Anthracnose, the tree will be fine
- D. Crown galls, the tree will decline

40. The collection of petals on a flower is referred to as the:

- A. corolla
- B. inflorescence
- C. ovary
- D. solitary flowers

2019 Minnesota FFA Nursery-Landscape CDE

Lawn Establishment Practicum - 50 pts.



1. Using the lawn diagram above, how many square feet are included in the total lawn? 5 pts.
- A. 17,850 ft²
 - B. 18,750 ft²
 - C. 24,750 ft²
 - D. 1,000 ft²

2. Using the following seed label, how many bags of seed will you need to purchase to seed the entire lawn at a rate of 2 lbs./1000 ft²? (ROUND UP to the nearest whole bag) 5 pts.

The Best "Primo" Bluegrass Blend

Pure Seed	Variety	Germ.	Origin
32%	Brill Kentucky Bluegrass	86%	OR
31%	Big Boy Creeping Red Fescue	87%	OR
18%	Magic Perennial Ryegrass	90%	OR
17%	Dream Annual Ryegrass	90%	OR

Other Ingredients

0.50%	Other Crop Seed
1%	Inert Matter
0.50%	Weed Seed

Noxious Weed Seeds: None Found

Net Weight 3 lbs. (1.36 kg)

- A. 2
- B. 10
- C. 13
- D. 12

3. Using the same seed label, how many actual pounds of Big Boy Creeping Red Fescue will be used when seeding the entire lawn? 5 pts.

- A. 11.625 lbs.
- B. 13.625 lbs.
- C. 5.625 lbs.
- D. 11.265 lbs.

4. You're concerned about germination of the Big Boy Creeping Red Fescue and want to increase the seeding rate to compensate for the germination rate of this seed listed on the label. How many bags of seed will you need to purchase to compensate for this germination rate and to achieve the equivalent of 100% germination? (ROUND UP to the nearest whole bag) 10 pts.

- A. 15 bags
- B. 14 bags
- C. 12 bag
- D. 5 bags

5. Your client is thinking about direct-spading in several large trees into the top portion of the lawn, it will cover the entire dark grey area in the diagram. You suggest a tall fescue blend to seed for that area which will be more shade tolerant than the Kentucky bluegrass blend used in the other areas of the lawn.

Using the following seed label, how many bags of seed will you need to purchase to seed the dark grey section of lawn at a rate of 7 lbs./1000 ft²? (ROUND UP to the nearest whole bag) 5 pts.

Shady Character Tall Fescue Shade Blend			
Pure Seed	Variety	Germ.	Origin
30%	Warhol Tall Fescue	85%	OR
30%	Big Time Tall Fescue	85%	OR
30%	Artistry Tall Fescue	85%	OR
8%	Yale Hard Fescue	85%	OR
Other Ingredients			
0.50%	Other Crop Seed		
1%	Inert Matter		
0.50%	Weed Seed		
Noxious Weed Seeds: None Found			
Net Weight 5 lbs. (2.27 kg)			

- A. 26
- B. 5
- C. 27
- D. 6

6. Using the same seed label and same rate of seeding, how many actual pounds of Yale Hard Fescue will be used when seeding dark grey section of lawn? 5 pts.

- A. 10.5 lbs.
- B. 11.5 lbs.
- C. 2.1 lbs.
- D. 4.2 lbs.

7. At the last minute you decided to perform a soil test on the entire lawn to determine soil texture and organic matter percentage (OM%). The test returned a fairly low result showing just 1.25% in a sandy loam soil. Which product will be a good choice for incorporating into the soil at the site to improve soil organic matter? 5 pts.

- A. Fresh manure from your aunt and uncle's dairy farm
- B. Fresh sawdust from your sister's sawmill
- C. Composted sawdust from your sister's sawmill
- D. Clay soil from your best friend's tree farm

8. You want to incorporate the organic matter in the entire lawn at a rate of 0.35 cubic yards per 1000 ft². How much organic matter will you need to apply to the whole lawn? (ROUND UP to the nearest whole cubic yard) 5 pts.

- A. 7 cubic yards
- B. 6 cubic yards
- C. 5 cubic yards
- D. 4 cubic yards

2019 Minnesota FFA Nursery-Landscape CDE
Problem Solving - 100 pts.

1. You have a VIP client that is having issues with black spot in their award-winning rose collection. What is your best recommendation for quick, effective control? 10 pts.
- A. Increase watering to 2X rate for four weeks
 - B. Introduce a beneficial predator such as lacewings
 - C. Apply chlorothalonil (a fungicide)
 - D. Recommend they start over with different plants
2. It's now early winter and the same client described above has an extensive collection of lilacs. They really enjoy the blossoms but want you to start shearing the plants into a more formal shape. When should you start shearing to preserve the blossoms? 10 pts.
- A. Immediately, VIP clients get what they want, when they want it
 - B. Early next spring, just before bud break
 - C. Early next spring, just before flowering
 - D. Early next spring, just after flowering
3. Your sister runs a sawmill operation and she's interested in starting a compost business selling her waste sawdust. She asks you for your recommendation on the best method of accelerating the composting process with fresh sawdust. 10 pts.
- A. Apply ammonium nitrate, turn, and irrigate the sawdust pile regularly
 - B. Apply ammonium phosphate, turn, and irrigate the sawdust pile regularly
 - C. Apply potassium phosphate and allow the pile to bake in an open sun location
 - D. Apply chlorothalonil (a fungicide) on a daily basis for a least one year
4. Your sister wants you to help her redesign the landscape around her sawmill, to make it more attractive for the new compost customers. The place is kind of a mess but she really wants something that will attract customers to the front door. What kind of plant(s) do you recommend? 10 pts.
- A. A key plant like Anthony Waterer spirea
 - B. A specimen plant like Sugar Tyme crabapple
 - C. An accent plant like Purple Wave petunias
 - D. A form and function plant like yew

5. Your aunt and uncle love paper birch (*Betula papyrifera*) and have planted them all around their farm house in Fillmore County Minnesota. Over the last few years they have noticed the trees aren't looking very good and they sent you a few photos showing a lot of decline and dieback in the trees. What's the most common cause of the problems with their trees? 10 pts.

- A. They aren't winter hardy and the dieback is due to winter kill
- B. Emerald ash borer (*Agilus plannipennis*)
- C. Bronze birch borer (*Agilus anxius*)
- D. Emerald birch Borer (*Agilus emeraldii*)

6. For a sod installation project in your backyard you will need to remove the existing crabgrass in an area that measures 2,325 ft². The recommendation is to use a non-selective herbicide containing glyphosate. The recommended rate for elimination of existing vegetation is 4 fluid ounces (fl.oz.) of product per gallon of water. One gallon of solution will treat 1000 ft². How many fl.oz. of herbicide will be needed for the given area? 10 pts.

- A. 6.5 fl.oz.
- B. 9.3 fl.oz.
- C. 5.6 fl.oz.
- D. 3.9 fl.oz.

7. Using information from the previous question, how many grams of the active ingredient (glyphosate) was applied to your lawn? (See Herbicide Label below) 10 pts.
(1 L = 33.8 fl.oz.)

- A. 181.6 g
- B. 180.5 g
- C. 179.4 g
- D. 178.3 g

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).

8. 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 his 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 125.6 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 \$5.50 per **diameter inch**. After computing diameter at breast height (DBH), round up to the nearest whole inch when making your cost calculations.

$$\text{diameter} = \text{circumference} / \pi$$

$$\pi = 3.14159$$

What price should you quote the resident? (ROUND UP TO THE NEAREST WHOLE DOLLAR)

- A. \$694.00
- B. \$693.00
- C. \$220.00
- D. \$200.00

9. You've decided to start a tree removal business to help supply your sister with quality logs for her sawmill. You know that you and your staff will be operating chainsaws to process trees into logs. What type of Personal Protective Equipment (PPE) will you need to purchase for your staff? 10 pts.

- A. Chainsaw protective pants, wide-brimmed hats, and Ray Ban sunglasses
- B. Work gloves and hard hats
- C. Hard hats, work gloves, and Nike Air Jordans
- D. Chainsaw protective chaps, safety glasses, gloves, hard hat, steel toe boots

10. Your brother is a newly licensed pesticide applicator in Minnesota and he applied some herbicide at your sister's sawmill for control of some broad-leafed weeds near your newly installed landscape. Later that summer she noticed that her Sugar Tyme crabapple has stunted, distorted leaves. Which herbicide do you think he used and why is it affecting the crabapple?
10 pts.

- A. **Herbicide #1** was applied during a time of very high temperatures causing volatilization of the herbicide and damage to the crabapple
- B. **Herbicide #1** was applied during a time of very low temperatures causing volatilization of the herbicide and damage to the crabapple
- C. **Herbicide #2** was applied during a time of very high temperatures causing volatilization of the herbicide and damage to the crabapple
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Herbicide #1



**ACTIVE CONSTITUENT: 625 g/L 2,4-D
present as the DIMETHYLAMINE AND DIETHANOLAMINE SALTS**

Herbicide #2



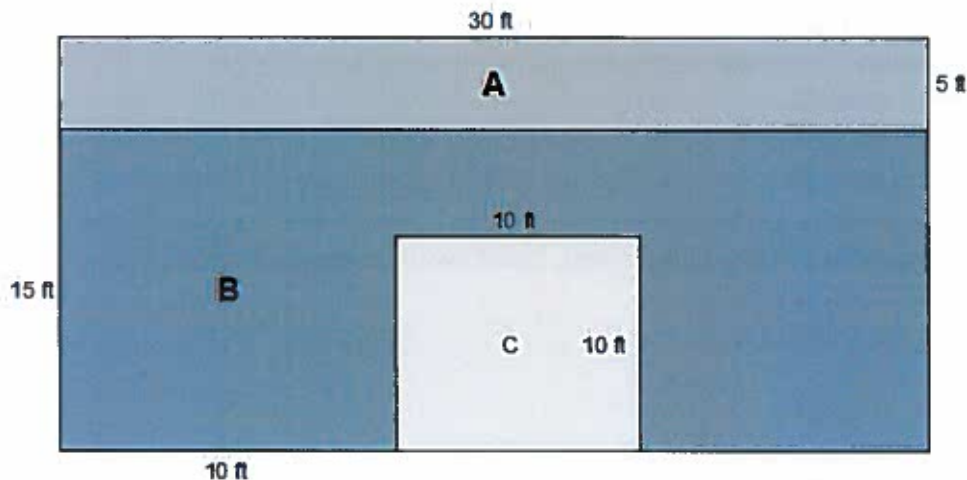
**ACTIVE CONSTITUENT: 680g/L 2,4-D present as the
2-ETHYLHEXYL ESTER**

2019 Minnesota FFA Nursery-Landscape CDE

Raised Bed Practicum - 50 pts.

Determine the amount of plants and their associated costs with the installation of the raised bed as described below.

Raised Bed: Three sections, each having unique dimensions



Section A: Will be planted as a privacy fence.

Option 1: Arborvitae (5' width) Cost: \$119.99 per tree

Option 2: Eastern Redcedar (6' width) Cost: \$38.95 per tree

Section B: Will be planted with ornamental shrubs.

Option 1: Elderberry (5' width) Cost: \$40.00 per plant

Option 2: Spirea (2.5' width) Cost: \$19.99 per plant

Section C: Will be planted with flowers.

Option 1: Peonies (5' width) Cost: \$29.00 per plant

Option 2: Daylilies (2' width) Cost: \$6.50 per plant

1. How many Arborvitae can be planted? 3 pts.
 - A. 10 trees
 - B. 6 trees
 - C. 3 trees
 - D. 8 trees
2. How many Eastern Redcedar can be planted? 3 pts.
 - A. 4 trees
 - B. 6 trees
 - C. 5 trees
 - D. 12 trees
3. If Arborvitae were planted, then how much would it cost? 5 pts.
 - A. \$719.94
 - B. \$1006.62
 - C. \$599.95
 - D. \$706.99
4. If Eastern Redcedar were planted, then how much would it cost? 5 pts.
 - A. \$205.92
 - B. \$194.75
 - C. \$306.50
 - D. \$186.50
5. How many Elderberry can be planted? 3 pts.
 - A. 6 shrubs
 - B. 14 shrubs
 - C. 11 shrubs
 - D. 8 shrubs
6. How many Spirea can be planted? 3 pts.
 - A. 16 shrubs
 - B. 29 shrubs
 - C. 57 shrubs
 - D. 56 shrubs
7. If Elderberry were planted, then how much would it cost? 5 pts.
 - A. \$440.00
 - B. \$560.00
 - C. \$320.00
 - D. \$240.00
8. If Spirea were planted, then how much would it cost? 5 pts.
 - A. \$319.84
 - B. \$1139.43
 - C. \$1119.44
 - D. \$579.71

9. How many Peonies can be planted? 3 pts.
- A. 2 plants
 - B. 5 plants
 - C. 4 plants
 - D. 1 plant
10. How many Daylilies can be planted? 3 pts.
- A. 3 plants
 - B. 25 plants
 - C. 15 plants
 - D. 12 plants
11. If Peonies were planted, then how much would it cost? 5 pts.
- A. \$116.00
 - B. \$161.00
 - C. \$216.00
 - D. \$49.00
12. If Daylilies were planted, then how much would it cost? 5 pts.
- A. \$56.00
 - B. \$42.50
 - C. \$162.50
 - D. \$22.50
13. In order to maintain plant health and retention of water, the owner has decided to mulch the entire bed. The mulch costs \$16.00 per cubic yard (1 cubic yard = 27 cubic feet). Assume the mulch will be spread evenly to a depth 6 inches. How much would this cost? (ROUND TO NEAREST CUBIC YARD) 2 pts.
- A. \$206.00
 - B. \$192.00
 - C. \$106.00
 - D. \$506.00

KEY

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- B. 7, 11**
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- C. Oil mixed with fuel**
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- C. soil textures
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 - B. An outdoor store
 - C. Registered endophyte incidence
 - D. Remnants entry indicator
25. A _____ must be installed on an irrigation system to prevent water from re-entering into the water source.
- A. Solenoid
 - B. Master valve
 - C. Isolation valve
 - D. Vacuum breaker**
26. A plant with two or more leaves at the same node which wrap around the stem or petiole are called:
- A. Alternate
 - B. Whorled**
 - C. Alternate
 - D. Sub-opposite

27. The influence of gravity which causes roots to grow down into a soil is known as:
- A. Phototropism
 - B. Gravitational pull
 - C. Subterranean pull
 - D. Geotropism**
28. When pruning a scaffold branch that will remain on the tree until future removal, a _____ cut is made to suppress growth.
- A. thinning
 - B. reduction**
 - C. rejuvenation
 - D. topping
29. A layer of partially decomposed stems, roots, and leaves of grass which develops above the soil surface in a turf area is called:
- A. mulch
 - B. thatch**
 - C. rhizomes
 - D. mineral matter
30. Which type of mower would be used to mow a tee box on a golf course?
- A. reel mower**
 - B. flail mower
 - C. rotary mower
 - D. sickle mower
31. Scientists that study and research fruiting plants are called:
- A. botanists
 - B. viticulturists
 - C. olericulturists
 - D. pomologists**

32. A broadleaf annual weed that emerges in early spring, can found along sidewalk edges and poorly managed turf, has dull blue-green, oblong leaves, and is prostrate can be identified as:
- A. dandelion
 - B. chickweed
 - C. clover
 - D. knotweed**
33. A construction site must prevent water from leaving a site to reduce sediment from entering waterways. Examples of procedures that will aid in reducing runoff include:
- A. installing a silt fence perimeter and bio-logs around catch basins**
 - B. installing a silt fence at the site entrance and using a sump pump
 - C. using a sump pump and plugging the catch basins
 - D. installing a drain tile and digging a trench
34. When calibrating a fertilizer/herbicide/salt spreader you should:
- A. use the manufacturer's recommended setting
 - B. use the exact same product you will be applying**
 - C. find any area that needs to be treated
 - D. operate the spreader until the excess runs out
35. Which of the following nutrients are classified as micro nutrients?
- A. Nitrogen, Carbon
 - B. Phosphorus, Sulfur
 - C. Iron, Manganese**
 - D. Calcium, Magnesium
36. Minnesota is located in what three plant hardiness zones?
- A. 4,5,6
 - B. 3,4,6
 - C. 2,3,4
 - D. 3,4,5**
37. Monocot stems have the xylem and phloem that are:
- A. one each side of the cambium layer
 - B. in small bundles scattered through the stem**
 - C. side by side
 - D. near the outside of the stems

38. The term used to describe landscaping techniques that conserve water is:

- A. Xeriscaping
- B. Conserviscaping
- C. Aridscaping
- D. Instascaping

39. A client is concerned with their older Hackberry; there are several small, round, light green, lesions protruding from the leaves. What are they and will kill the tree?

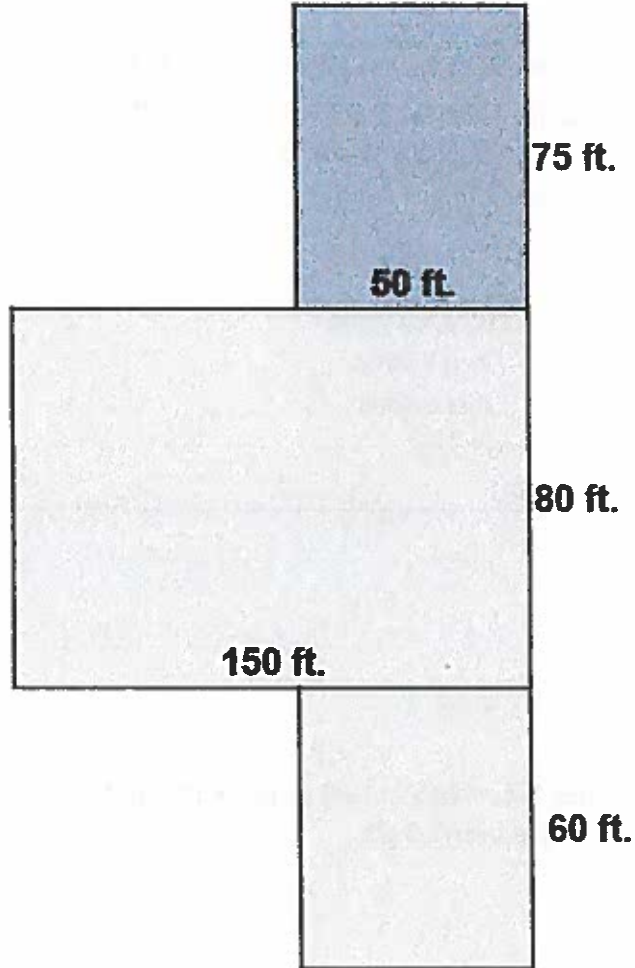
- A. Leaf galls, the tree will be fine
- B. Canker, the tree will decline
- C. Anthracnose, the tree will be fine
- D. Crown galls, the tree will decline

40. The collection of petals on a flower is referred to as the:

- A. corolla
- B. inflorescence
- C. ovary
- D. solitary flowers

KLEU

2019 Minnesota FFA Nursery-Landscape CDE
Lawn Establishment Practicum - 50 pts.



1. Using the lawn diagram above, how many square feet are included in the total lawn? 5 pts.
- A. 17,850 ft²
 - B. 18,750 ft²
 - C. 24,750 ft²
 - D. 1,000 ft²

2. Using the following seed label, how many bags of seed will you need to purchase to seed the entire lawn at a rate of 2 lbs./1000 ft²? (ROUND UP to the nearest whole bag) 5 pts.

The Best "Primo" Bluegrass Blend			
Pure Seed	Variety	Germ.	Origin
32%	Brill Kentucky Bluegrass	86%	OR
31%	Big Boy Creeping Red Fescue	87%	OR
18%	Magic Perennial Ryegrass	90%	OR
17%	Dream Annual Ryegrass	90%	OR
Other Ingredients			
0.50%	Other Crop Seed		
1%	Inert Matter		
0.50%	Weed Seed		
Noxious Weed Seeds: None Found			
Net Weight 3 lbs. (1.36 kg)			

- A. 2
- B. 10
- C. 13
- D. 12

3. Using the same seed label, how many actual pounds of Big Boy Creeping Red Fescue will be used when seeding the entire lawn? 5 pts.

- A. 11.625 lbs.
- B. 13.625 lbs.
- C. 5.625 lbs.
- D. 11.265 lbs.

4. You're concerned about germination of the Big Boy Creeping Red Fescue and want to increase the seeding rate to compensate for the germination rate of this seed listed on the label. How many bags of seed will you need to purchase to compensate for this germination rate and to achieve the equivalent of 100% germination? (ROUND UP to the nearest whole bag) 10 pts.

- A. 15 bags
- B. 14 bags
- C. 12 bag
- D. 5 bags

5. Your client is thinking about direct-spading in several large trees into the top portion of the lawn, it will cover the entire dark grey area in the diagram. You suggest a tall fescue blend to seed for that area which will be more shade tolerant than the Kentucky bluegrass blend used in the other areas of the lawn.

Using the following seed label, how many bags of seed will you need to purchase to seed the dark grey section of lawn at a rate of 7 lbs./1000 ft²? (ROUND UP to the nearest whole bag) 5 pts.

Shady Character Tall Fescue Shade Blend

Pure Seed	Variety	Germ.	Origin
30%	Warhol Tall Fescue	85%	OR
30%	Big Time Tall Fescue	85%	OR
30%	Artistry Tall Fescue	85%	OR
8%	Yale Hard Fescue	85%	OR
Other Ingredients			
0.50%	Other Crop Seed		
1%	Inert Matter		
0.50%	Weed Seed		
Noxious Weed Seeds: None Found			
Net Weight 5 lbs. (2.27 kg)			

- A. 26
- B. 5
- C. 27
- D. 6

6. Using the same seed label and same rate of seeding, how many actual pounds of Yale Hard Fescue will be used when seeding dark grey section of lawn? 5 pts.

- A. 10.5 lbs.
- B. 11.5 lbs.
- C. 2.1 lbs.
- D. 4.2 lbs.

7. At the last minute you decided to perform a soil test on the entire lawn to determine soil texture and organic matter percentage (OM%). The test returned a fairly low result showing just 1.25% in a sandy loam soil. Which product will be a good choice for incorporating into the soil at the site to improve soil organic matter? 5 pts.

- A. Fresh manure from your aunt and uncle's dairy farm
- B. Fresh sawdust from your sister's sawmill
- C. Composted sawdust from your sister's sawmill
- D. Clay soil from your best friend's tree farm

8. You want to incorporate the organic matter in the entire lawn at a rate of 0.35 cubic yards per 1000 ft². How much organic matter will you need to apply to the whole lawn? (ROUND UP to the nearest whole cubic yard) 5 pts.

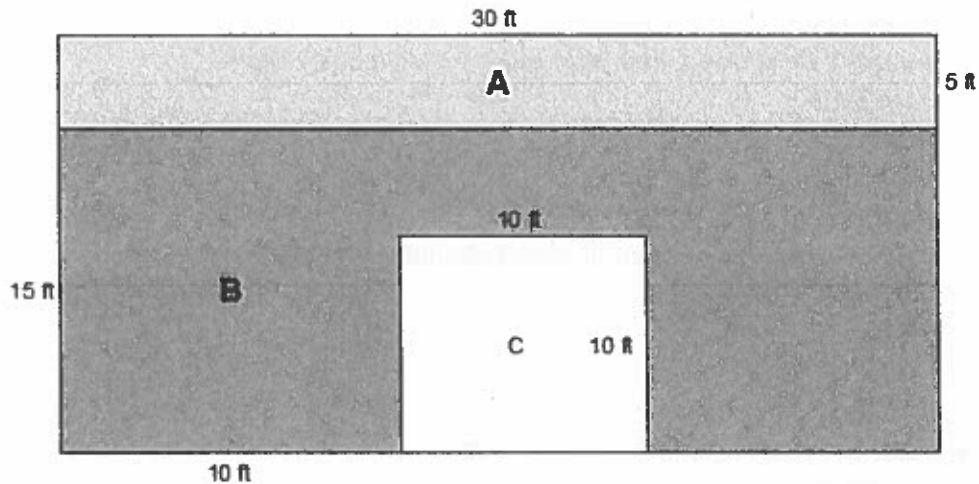
- A. 7 cubic yards
- B. 6 cubic yards
- C. 5 cubic yards
- D. 4 cubic yards

KEY

2019 Minnesota FFA Nursery-Landscape CDE
Raised Bed Practicum - 50 pts.

Determine the amount of plants and their associated costs with the installation of the raised bed as described below.

Raised Bed: Three sections, each having unique dimensions



Section A: Will be planted as a privacy fence.

Option 1: Arborvitae (5' width) Cost: \$119.99 per tree

Option 2: Eastern Redcedar (6' width) Cost: \$38.95 per tree

Section B: Will be planted with ornamental shrubs.

Option 1: Elderberry (5' width) Cost: \$40.00 per plant

Option 2: Spirea (2.5' width) Cost: \$19.99 per plant

Section C: Will be planted with flowers.

Option 1: Peonies (5' width) Cost: \$29.00 per plant

Option 2: Daylilies (2' width) Cost: \$6.50 per plant

1. How many Arborvitae can be planted? 3 pts.
 - A. 10 trees
 - B. 6 trees
 - C. 3 trees
 - D. 8 trees
2. How many Eastern Redcedar can be planted? 3 pts.
 - A. 4 trees
 - B. 6 trees
 - C. 5 trees
 - D. 12 trees
3. If Arborvitae were planted, then how much would it cost? 5 pts.
 - A. \$719.94
 - B. \$1006.62
 - C. \$599.95
 - D. \$706.99
4. If Eastern Redcedar were planted, then how much would it cost? 5 pts.
 - A. \$205.92
 - B. \$194.75
 - C. \$306.50
 - D. \$186.50
5. How many Elderberry can be planted? 3 pts.
 - A. 6 shrubs
 - B. 14 shrubs
 - C. 11 shrubs
 - D. 8 shrubs
6. How many Spirea can be planted? 3 pts.
 - A. 16 shrubs
 - B. 29 shrubs
 - C. 57 shrubs
 - D. 56 shrubs
7. If Elderberry were planted, then how much would it cost? 5 pts.
 - A. \$440.00
 - B. \$560.00
 - C. \$320.00
 - D. \$240.00
8. If Spirea were planted, then how much would it cost? 5 pts.
 - A. \$319.84
 - B. \$1139.43
 - C. \$1119.44
 - D. \$579.71

9. How many Peonies can be planted? 3 pts.
- A. 2 plants
 - B. 5 plants
 - C. 4 plants
 - D. 1 plant
10. How many Daylilies can be planted? 3 pts.
- A. 3 plants
 - B. 25 plants
 - C. 15 plants
 - D. 12 plants
11. If Peonies were planted, then how much would it cost? 5 pts.
- A. \$116.00
 - B. \$161.00
 - C. \$216.00
 - D. \$49.00
12. If Daylilies were planted, then how much would it cost? 5 pts.
- A. \$56.00
 - B. \$42.50
 - C. \$162.50
 - D. \$22.50
13. In order to maintain plant health and retention of water, the owner has decided to mulch the entire bed. The mulch costs \$16.00 per cubic yard (1 cubic yard = 27 cubic feet). Assume the mulch will be spread evenly to a depth 6 inches. How much would this cost? (ROUND TO NEAREST CUBIC YARD) 2 pts.
- A. \$206.00
 - B. \$192.00
 - C. \$106.00
 - D. \$506.00

KEY

2019 Minnesota FFA Nursery-Landscape CDE
Problem Solving - 100 pts.

1. You have a VIP client that is having issues with black spot in their award-winning rose collection. What is your best recommendation for quick, effective control? 10 pts.

- A. Increase watering to 2X rate for four weeks
- B. Introduce a beneficial predator such as lacewings
- C. Apply chlorothalonil (a fungicide)
- D. Recommend they start over with different plants

2. It's now early winter and the same client described above has an extensive collection of lilacs. They really enjoy the blossoms but want you to start shearing the plants into a more formal shape. When should you start shearing to preserve the blossoms? 10 pts.

- A. Immediately, VIP clients get what they want, when they want it
- B. Early next spring, just before bud break
- C. Early next spring, just before flowering
- D. Early next spring, just after flowering

3. Your sister runs a sawmill operation and she's interested in starting a compost business selling her waste sawdust. She asks you for your recommendation on the best method of accelerating the composting process with fresh sawdust. 10 pts.

- A. Apply ammonium nitrate, turn, and irrigate the sawdust pile regularly
- B. Apply ammonium phosphate, turn, and irrigate the sawdust pile regularly
- C. Apply potassium phosphate and allow the pile to bake in an open sun location
- D. Apply chlorothalonil (a fungicide) on a daily basis for a least one year

4. Your sister wants you to help her redesign the landscape around her sawmill, to make it more attractive for the new compost customers. The place is kind of a mess but she really wants something that will attract customers to the front door. What kind of plant(s) do you recommend? 10 pts.

- A. A key plant like Anthony Waterer spirea
- B. A specimen plant like Sugar Tyme crabapple
- C. An accent plant like Purple Wave petunias
- D. A form and function plant like yew

5. Your aunt and uncle love paper birch (*Betula papyrifera*) and have planted them all around their farm house in Fillmore County Minnesota. Over the last few years they have noticed the trees aren't looking very good and they sent you a few photos showing a lot of decline and dieback in the trees. What's the most common cause of the problems with their trees? 10 pts.

- A. They aren't winter hardy and the dieback is due to winter kill
- B. Emerald ash borer (*Agilus plannipennis*)
- C. Bronze birch borer (*Agilus anxius*)
- D. Emerald birch Borer (*Agilus emeraldii*)

6. For a sod installation project in your backyard you will need to remove the existing crabgrass in an area that measures 2,325 ft². The recommendation is to use a non-selective herbicide containing glyphosate. The recommendation is to use a non-selective herbicide containing glyphosate. The recommended rate for elimination of existing vegetation is 4 fluid ounces (fl.oz.) of product per gallon of water. One gallon of solution will treat 1000 ft². How many fl.oz. of herbicide will be needed for the given area? 10 pts.

- A. 6.5 fl.oz.
- B. 9.3 fl.oz.
- C. 5.6 fl.oz.
- D. 3.9 fl.oz.

7. Using information from the previous question, how many grams of the active ingredient (glyphosate) was applied to your lawn? (See Herbicide Label below) 10 pts.
(1 L = 33.8 fl.oz.)

- A. 181.6 g
- B. 180.5 g
- C. 179.4 g
- D. 178.3 g

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).

8. 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 his 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 125.6 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 \$5.50 per diameter inch. After computing diameter at breast height (DBH), round up to the nearest whole inch when making your cost calculations.

$$\text{diameter} = \text{circumference} / \pi$$

$$\pi = 3.14159$$

What price should you quote the resident?

- A. \$694.00
- B. \$693.00
- C. \$220.00
- D. \$200.00

9. You've decided to start a tree removal business to help supply your sister with quality logs for her sawmill. You know that you and your staff will be operating chainsaws to process trees into logs. What type of Personal Protective Equipment (PPE) will you need to purchase for your staff? 10 pts.

- A. Chainsaw protective pants, wide-brimmed hats, and Ray Ban sunglasses
- B. Work gloves and hard hats
- C. Hard hats, work gloves, and Nike Air Jordans
- D. Chainsaw protective chaps, safety glasses, gloves, hard hat, steel toe boots

10. Your brother is newly licensed pesticide applicator in Minnesota and he applied some herbicide at your sister's sawmill for control of some broad-leafed weeds near your newly installed landscape. Later that summer she noticed that her Sugar Tyme crabapple has stunted, distorted leaves. Which herbicide do you think he used and why is it affecting the crabapple?
10 pts.

- A. Herbicide #1 was applied during a time of very high temperatures causing volatilization of the herbicide and damage to the crabapple
- B. Herbicide #1 was applied during a time of very low temperatures causing volatilization of the herbicide and damage to the crabapple
- C. Herbicide #2 was applied during a time of very high temperatures causing volatilization of the herbicide and damage to the crabapple
- D. Herbicide #2 was applied during a time of very low temperatures causing volatilization of the herbicide and damage to the crabapple

Herbicide #1



ACTIVE CONSTITUENT: 625 g/L 2,4-D
present as the DIMETHYLAMINE AND DIETHANOLAMINE SALTS

Herbicide #2



ACTIVE CONSTITUENT: 680g/L 2,4-D present as the
2-ETHYLHEXYL ESTER

