

2010 National Floriculture Career Development Event

Problem One

Assume you are responsible for helping a customer select a lighting system for the reception area in his sales office. The area has an 18' vaulted ceiling. He has set no limit on installation cost, but wants a lighting system with a low operating cost. He wants a lighting system that provides good general lighting and good plant growth. Use the table provided to determine the type of lighting you will recommend to him. Your recommendation is:

- A. cool white fluorescent tubes
- B. florescent plant growth lamps
- C. wide spectrum plant growth lamps
- D. metal halide lamps**

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Problem Two

Assume you are to prepare a materials estimate for the construction of 2 flower/shrub beds for a customer. One bed is to be a circle that is 16' in diameter and the other is a rectangle that is 8' x 14'. You are to determine the total linear feet of curbing needed and the cubic yards of top soil needed to fill both beds with a 3" layer. Round amounts up.

- A. 95 linear feet curbing and 3 cubic yards of top soil
- B. 38 linear feet curbing and 28 cubic yards of top soil
- C. 38 linear feet curbing and 3 cubic yards of top soil
- D. 95 linear feet curbing and 28 cubic yards of top soil

linear feet curbing for circular bed ($\pi d = \text{circumference}$)

$$3.14 \times 16' = 50.24' = 50' 3''$$

linear feet curbing for rectangular bed $(\text{length} + \text{width})2 = \text{linear feet}$

$$(8' + 14')2 = 44'$$

total curbing needed $50'3'' + 44' = 94' 3''$

cubic yards top soil needed for circular bed ($\pi r^2 h = \text{volume}$)

$$3.14 \times 8^2 \times (3/12) = 50.24 \text{ cubic feet} / 27 = 1.86 \text{ cubic yards}$$

cubic yards top soil needed for rectangular bed $(\text{length} \times \text{width} \times \text{height} = \text{volume})$

$$8 \times 14 \times 3/12 = 28 \text{ cubic feet} / 27 = 1.04 \text{ cubic yards}$$

total cubic yards of top soil needed $1.86 + 1.04 = 2.9$ or 3 cubic yards

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Problem Three

Assume your floral shop does some landscape design work for regular customers. Your shop is located in Indianapolis, Indiana. You are assigned to work with a homeowner who wants to incorporate flowering shrubs in his back lawn that will attract bluebirds year round. Use the charts provided to identify shrubs that would attract bluebirds.

- A. **WINTERBERRY, AMERICAN ELDER, ARROWWOOD, BAYBERRY, HIGH-BUSH BLACKBERRY**
- B. **WINTERBERRY, AMERICAN ELDER, AMUR HONEYSUCKLE, BAYBERRY, HIGH-BUSH BLACKBERRY**
- C. **BLACK HAW, AMERICAN ELDER, ARROWWOOD, BAYBERRY, HIGH-BUSH BLACKBERRY**
- D. **WINTERBERRY, AMERICAN ELDER, ARROWWOOD, BAYBERRY, NANNYBERRY**

A selection of flowering shrubs to attract birds

REGION	SHRUB	FRUIT OR FLOWER	SEASON	BIRDS MOST OFTEN ATTRACTED
NORTHEAST Connecticut Delaware Illinois Indiana Iowa Kentucky Maine Maryland Massachusetts Michigan Minnesota Missouri New Hampshire New Jersey New York Ohio Ontario Pennsylvania Quebec Rhode Island Vermont Virginia West Virginia Wisconsin	AMERICAN ELDER	Blue-black berries	Late summer to midfall	BLUEBIRDS, CATBIRDS, FLICKERS, MOCKINGBIRDS, ROSE-BREADED GROSBEAKS, WOODPECKERS
	AMUR HONEYSUCKLE	Red berries	Fall to midwinter	CARDINALS, CEDAR WAXWINGS, ROBINS, THRASHERS, THRUSHES, TOWHEES, WINTER FINCHES
	ARROWWOOD	Blue-black berries	Fall	BLUEBIRDS, CATBIRDS, FLICKERS, ROBINS, THRUSHES
	BAYBERRY	Gray berries	Fall to early spring	BLUEBIRDS, CAROLINA WRENS, DOWNY WOODPECKERS, HERMIT THRUSHES, MYRTLE WARBLERS, TREE SWALLOWS
	BLACK HAW	Blue-black berries	Fall	CEDAR WAXWINGS, PILEATED WOODPECKERS, SWAINSON'S THRUSHES, YELLOW-BILLED CUCKOOS
	HIGH-BUSH BLUEBERRY	Blue-black berries	Midsummer to midfall	BLUEBIRDS, CHICKADEES, HERMIT THRUSHES, ORCHARD ORIOLES, ROBINS, TOWHEES
	NANNYBERRY	Black berries	Fall	CATBIRDS, CEDAR WAXWINGS, FLICKERS, HERMIT THRUSHES, ROBINS, ROSE-BREADED GROSBEAKS
	PINKSTER-BLOOM AZALEA	Pink or white flowers	Spring	RUBY-THROATED HUMMINGBIRDS
	SARGENT CRAB APPLE	White flowers	Spring	RUBY-THROATED HUMMINGBIRDS
		Dark red fruit	Fall	CEDAR WAXWINGS, EVENING AND PINE GROSBEAKS, PURPLE FINCHES, ROBINS
	SIBERIAN DOGWOOD	Blue-white berries	Fall	CARDINALS, CHATS, FINCHES, FLYCATCHERS, MOCKINGBIRDS, TREE SWALLOWS
	TATARIAN HONEYSUCKLE	Pink or red flowers	Late spring	RUBY-THROATED HUMMINGBIRDS,
		Red or yellow berries	Summer	BROWN THRASHERS, CATBIRDS, CEDAR WAXWINGS, PURPLE FINCHES, ROBINS
	WINTERBERRY	Red berries	Late summer to midwinter	BLUEBIRDS, BROWN THRASHERS, CARDINALS, CEDAR WAXWINGS
SOUTH AND SOUTHEAST Alabama Arkansas Florida Georgia Louisiana Mississippi North Carolina South Carolina Tennessee	AMERICAN ELDER	Blue-black berries	Late summer to midfall	BROWN THRASHERS, CARDINALS, CAROLINA CHICKADEES, CHATS, FLICKERS, INDIGO BUNTINGS, MOCKINGBIRDS, PHOEBES
	ARROWWOOD	Blue-black berries	Fall	BROWN THRASHERS, CATBIRDS, PHOEBES, ROBINS, WHITE-EYED VIREOS
	BAYBERRY	Gray berries	Fall to early spring	DOWNY WOODPECKERS, HERMIT THRUSHES, MYRTLE WARBLERS, TREE SWALLOWS
	BLACK HAW	Blue-black berries	Fall	CAROLINA CHICKADEES, DOWNY AND RED-BELLIED WOODPECKERS, HERMIT THRUSHES, MOCKINGBIRDS
	HIGH-BUSH BLUEBERRY	Blue-black berries	Midsummer to midfall	CATBIRDS, CHATS, ORIOLES, PHOEBES, TANAGERS
	HYBRID WEIGELA	Pink, red or white flowers	Spring	RUBY-THROATED HUMMINGBIRDS
	MANY-FLOWERED COTONEASTER	Red berries	Fall	BLUEBIRDS, CEDAR WAXWINGS, MOCKINGBIRDS, ROBINS
	SAPPHIREBERRY	Blue berries	Fall	BLUEBIRDS, CARDINALS, CATBIRDS, MOCKINGBIRDS, SUMMER TANAGERS
	SIBERIAN DOGWOOD	Blue-white berries	Fall	BLUEBIRDS, CATBIRDS, CEDAR WAXWINGS, MOCKINGBIRDS, WOOD THRUSHES
	SMOOTH SUMAC	Red berries	Fall to early spring	BLUEBIRDS, CAROLINA CHICKADEES, CATBIRDS, DOWNY WOODPECKERS, MOCKINGBIRDS

(continued on next page)

A selection of flowering shrubs to attract birds (CONTINUED)

REGION	SHRUB	FRUIT OR FLOWER	SEASON	BIRDS MOST OFTEN ATTRACTED
NORTH AND SOUTH CENTRAL Kansas Manitoba Nebraska North Dakota Oklahoma South Dakota Texas	BEAUTY BUSH	Pink flowers	Early summer	RUBY-THROATED AND RUFIOUS HUMMINGBIRDS
	CORALBERRY	Purple-red berries	Fall to midwinter	HERMIT THRUSHES, PURPLE FINCHES, ROBINS, WAXWINGS, WOODPECKERS
	FRAGRANT SUMAC	Dark red berries	Summer	BLUEBIRDS, RED-HEADED WOODPECKERS, ROBINS, THRASHERS, YELLOW-SHAFTED FLICKERS
	NANNYBERRY	Black berries	Fall	CARDINALS, CATBIRDS, CEDAR WAXWINGS, FLICKERS, HERMIT THRUSHES, ROBINS
	ORANGE-EYED BUTTERFLY BUSH	Blue, pink, purple or white flowers	Midsummer to frost	RUBY-THROATED HUMMINGBIRDS
	SIBERIAN DOGWOOD	Blue-white berries	Fall	BLUEBIRDS, CARDINALS, CHATS, EVENING GROSBEAKS, THRUSHES, TREE SWALLOWS, WAXWINGS
	SIBERIAN PEA TREE	Yellow flowers	Spring	RUBY-THROATED AND RUFIOUS HUMMINGBIRDS
	WINTERBERRY	Red berries	Late summer to midwinter	BLUEBIRDS, BROWN THRASHERS, CARDINALS, CEDAR WAXWINGS, PURPLE FINCHES, ROBINS
WEST AND SOUTHWEST Alberta Arizona Colorado Idaho Montana Nevada New Mexico Saskatchewan Utah Wyoming	AMERICAN ELDER	Blue-black berries	Late summer to midfall	LEWIS'S WOODPECKERS, MAGPIES, MOUNTAIN BLUEBIRDS, SPARROWS, THRUSHES, WARBLING VIREOS
	BLACK HAW	Blue-black berries	Fall	HERMIT THRUSHES, ROBINS, TOWNSEND'S SOLITAIRES, VEERIES, WAXWINGS
	NANNYBERRY	Black berries	Fall	BLUEBIRDS, BOHEMIAN AND CEDAR WAXWINGS, CATBIRDS, FLICKERS, HERMIT THRUSHES
	RED OSIER DOGWOOD	White berries	Summer	BULLOCK'S ORIOLES, CARDINALS, HERMIT THRUSHES, MOCKINGBIRDS, SWAINSON'S THRUSHES
	RUNNING SERVICEBERRY	Purple-black berries	Summer	GREEN-TAILED TOWHEES, LEWIS'S WOODPECKERS, MAGPIES, SWAINSON'S THRUSHES, TOWNSEND'S SOLITAIRES
	SIBERIAN PEA TREE	Yellow flowers	Spring	BROAD-TAILED HUMMINGBIRDS
	SNOWBERRY	White berries	Midsummer to midwinter	EVENING AND PINE GROSBEAKS, MAGPIES, ROBINS, RUFIOUS-SIDED TOWHEES
	STAGHORN SUMAC	Red berries	Fall to early spring	EVENING GROSBEAKS, HERMIT THRUSHES, MAGPIES, ROBINS, TOWNSEND'S SOLITAIRES
	TATARIAN HONEYSUCKLE	Pink or red flowers	Late spring	BROAD-TAILED HUMMINGBIRDS,
		Red or yellow berries	Summer	BOHEMIAN AND CEDAR WAXWINGS, HERMIT AND SWAINSON'S THRUSHES
FAR WEST British Columbia California Oregon Washington	BEAUTY BUSH	Pink flowers	Early summer	ANNA'S, BLACK-CHINNED, CALLIOPE AND RUFIOUS HUMMINGBIRDS
	BLUE ELDER	Blue-black berries	Late summer	BLACK-HEADED GROSBEAKS, CALIFORNIA THRASHERS, PHAINOPEPLAS, STELLER'S JAYS, SWAINSON'S THRUSHES
	JAPANESE ROSE	Orange-red fruit	Fall	EVENING GROSBEAKS, ROBINS, THRUSHES, TOWHEES, TOWNSEND'S SOLITAIRES
	MAGELLAN FUCHSIA	Red and violet flowers	Early summer to frost	ANNA'S, BLACK-CHINNED, CALLIOPE AND RUFIOUS HUMMINGBIRDS
	SNOWBERRY	White berries	Midsummer to midwinter	BLACK-HEADED, EVENING AND PINE GROSBEAKS, ROBINS, SPOTTED TOWHEES, VARIED THRUSHES, WREN TITS

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Problem Four

Assume you are to assist a customer in applying Spring fertilizer to her lawn. Her lawn is 200' by 200' and her home and deck take up 4,300 square feet. She also has a 12' x 16' storage building in the back yard. Her soil test recommends 10-5-5 grade fertilizer applied at the rate of 0.2 lb. N / 1,000 square feet. Using the Amount of Fertilizer to Apply Based on Actual Nitrogen Recommendations table provided, identify the pounds of fertilizer that she would need.

- A. 71
- B. 142
- C. 177.5
- D. 124

Total square feet in yard including buildings	40,000 square feet
Square feet in residence/deck	4,300 square feet
Square feet in storage building	192 square feet
Square feet to be fertilized	35,508 square feet
pounds fertilizer to apply per 1,000 square feet	2 pounds fertilizer
pounds fertilizer required to fertilize lawn	71 pounds fertilizer

$$(200' \times 200' = 40,000 \text{ ft}_2) - 4,300 \text{ ft}_2 \text{ residence \& deck} - (12' \times 16' = 192 \text{ ft}_2) \text{ storage building} = 35,508 \text{ ft}_2$$

$$35,508 \text{ ft}_2 / 1,000 = 35.5 \times 2 = 71 \text{ pounds fertilizer}$$

Amount of Fertilizer to Apply Based on Actual Nitrogen Recommendations

Nitrogen Rate:	0.1 lb. N / 1,000 sq. ft.	0.2 lb. N / 1,000 sq. ft.	1 lb. N / 1,000 sq. ft.
	lbs. fertilizer to	lbs. fertilizer to	lbs. fertilizer to
	<u>apply per 1,000 sq. ft.</u>	<u>apply per 1,000 sq. ft.</u>	<u>apply per 1,000 sq. ft.</u>

Fertilizer Grade

45-0-0 (urea)	0.2	0.4	2.2
36-6-6	0.3	0.6	2.8
28-3-3	0.4	0.7	3.7
22-4-4	0.5	0.9	4.5
20-20-20	0.5	1.0	5.0
18-6-12	0.6	1.1	5.6
16-8-8	0.6	1.3	6.3
15-15-15	0.7	1.3	6.7
13-3-9	0.8	1.5	7.7
10-5-5	1.0	2.0	10.0
5-10-10	2.0	4.0	20.0

Example: If the N (nitrogen) recommendation is for 0.1 lb N / 1,000 sq. ft. and the fertilizer grade selected has a ratio of 18-6-12 (column 1), apply 0.6 lb. of this fertilizer per 1,000 square feet.

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Problem Five

Assume you are assisting a customer with the selection of a ground cover. The customer wants an evergreen cover that grows to no more than 8" in height, will withstand temperatures as low as -30° Fahrenheit, produces no flower or fruit, and will grow in the shade. Use the Guide to Groundcovers and USDA Plant Hardiness Zone Map attached to assist the customer. What ground cover would you recommend?

A. Myrtle or Periwinkle

B. Baltic English Ivy

C. Ajuga or bugle

D. Wandering Jew

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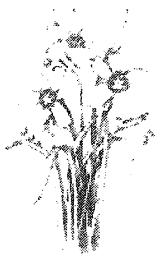
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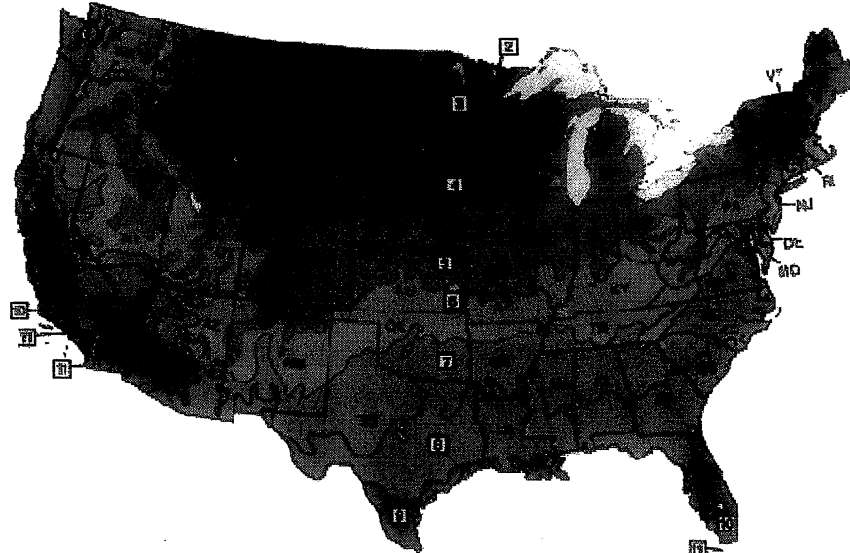
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USDA Plant Hardiness Zone Map



	Zone 2	-50° to -40°		Zone 7	0° to 10°
	Zone 3	-40° to -30°		Zone 8	10° to 20°
	Zone 4	-30° to -20°		Zone 9	20° to 30°
	Zone 5	-20° to -10°		Zone 10	30° to 40°
	Zone 6	-10° to -0°			

The US Department of Agriculture Plant Hardiness Zone Map, revised in 1990, shows the lowest temperatures that can be expected each year in the United States. These temperatures are referred to as "average annual minimum temperatures" and are based on the lowest temperatures recorded for each of the years 1974 to 1986. The different zones represent areas of winter hardiness for agricultural and natural landscape plants.

For each plant we offer, we include a range of hardiness zones, for instance, Zones 3-8. This means that we think that as far as temperature goes, that a particular species when established should be able to grow anywhere on the map between and including Zones 3 to 8. This is very general and one would need to take into account specific cultural and habitat requirements. So use a zone to determine minimum temperature thresholds and our ranges to determine broad climate tolerances.

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A Guide to Groundcovers

Groundcovers		Evergreen	Deciduous	Height	Optimum Spacing	No. Needed to Plant 100 sq. ft.	Light Tolerance	Hardiness Zone Rating	Flower or Fruit Color and Time of Effectiveness
Common Name	Botanical Name								
Ajuga or bugle	Ajuga reptans		*	5"	6 inches	400	sun or shade	4	blue or white flowers in summer
Coloneaster, creeping	Coloneaster adpressa		*	12"	4 feet	10	sun	4	pink flowers, red fruit in summer and fall
Coloneaster, rockspray	Coloneaster horizontalis	semi		18" plus	4 feet	10	sun	4	pink flowers, red fruit in summer and fall
Euonymus, big leaf winter creeper	Euonymus fortunei radicans	*		18" plus	3 feet	14	sun or shade	5	orange fruit in fall
Euonymus, purple leaf winter creeper	Euonymus fortunei coloratus	*		18"	3 feet	14	sun or shade	5	not of significance
Honeysuckle, creeping	Lonicera prostrata		*	12"	3 feet	14	sun	5	pale yellow flowers in spring, red fruit in fall
Ivy, Baltic English	Hedera helix battica	*		8"	18 inches	44	shade	4	none
Mondo	Ophiopogon japonicus	*		12"	10 inches	144	partial shade	8	white or pink flowers in spring
Myrtle or Periwinkle	Vinca minor	*		8"	12 inches	92	shade	4	blue flowers in spring
Oyster plant	Tragopogon portifolius		*	12"	12 inches	92	sun or shade	9	not of significance
Pachysandra	Pachysandra terrinialis	*		12"	12 inches	92	shade	4	white flowers in spring
Sarcococca	Sarcococca nuscifolia	*		fall—requires shearing	3 feet	14	sun or shade	7	white flowers and scarlet berries in fall
Wandering Jew	Tradescantia albiflora	*		6"	12 inches	92	shade	9	red-purple flowers in spring and summer
Weeping lantana	Lantana montevidensis	*		18" plus	24 inches	25	sun	9	lavender flowers all year
Yellowroot	Xanthorrhiza simplicissima		*	18" plus	18 inches	44	sun	5	brown-purple flowers in spring

A Guide to Vines

Common Name	Botanical Name	Broad-Leaved Evergreen	Deciduous	Height	Climbing	Twining or Tendrils	Light Tolerance	Hardness Zone Rating	Flower or Fruit Color and Time of Effectiveness
Actinidia, bower	Actinidia arguta		*	30'		*	full sun or semi-shade	4	white flowers in spring
Actinidia, Chinese	Actinidia chinensis		*	30'		*	full sun or semi-shade	7	insignificant
Akebia, fiveleaf	Akebia quinata	semi		35'		*	full sun or semi-shade	4	purple flowers in spring
Ampelopsis, porcelain	Ampelopsis brevipedunculata		*	20'		*	semi-shade	4	multicolored fruit in fall
Bignonia (or crossvine)	Bignonia capreolata		*	60'		*	full sun or semi-shade	6	orange-red flowers in spring
Bittersweet, American	Celastrus scandens		*	20'		*	sun or semi-shade	2	yellow and red fruit in fall and winter
Boston ivy	Parthenocissus viticissoides		*	60'		*	sun or shade	4	insignificant
Bougainvillea	Bougainvillea glabra		*	20'		*	full sun	7	multicolored in summer
Clematis	Clematis species		*	3' to 25'		*	full sun or semi-shade	4 to 7*	many colors of flowers in late spring
Eurostylis evergreen bittersweet	Eurostylis fortunei Vegetis	*		25'		*	sun or shade	5	yellow and red fruit in fall and winter
Fig, creeping	Ficus pumila	*		40'		*	sun or shade	9	insignificant
Hotter'suckle, hummel	Lonicera sempervirens		*	50'		*	full sun or semi-shade	3	orange flowers in summer, red fruit in fall
Hydrangea, climbing	Hydrangea anomala pedunculata		*	75'		*	full sun or semi-shade	4	white flowers in summer
Ivy, English	Hedera helix	*		70'		*	semi-shade	5	insignificant
Kidzu vine	Pueraria lobata		*	60'		*	sun or shade	6	insignificant
Monks hood vine	Ampelopsis aconitifolia		*	26'		*	semi-shade	4	yellow-orange fruit in fall
Rambling roses	Rosa multiflora hybrids and others		*	10' to 20'		support needed	sun	5	flowers of many colors in spring and summer
Trumpet vine	Campsis radicans		*	30'		*	sun	4	orange flowers in summer
Virginia creeper	Parthenocissus quinquefolia		*	50'		*	sun or shade	3	insignificant
Woodbine, Chinese	Lonicera tragophylla		*	50'		*	shade	5	yellow flowers in summer, red fruit in fall

*Dependent upon the actual species selected

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Problem Six

Assume your company has the contract to provide and install 10 shrubs for a customer. You are responsible for ordering premixed sand/peat to be used in the backfill mix. The backfill mix is to be 50% original soil and 50% sand/peat mix. The planting pits will have a volume of 18 cubic feet. The shrubs have a ball volume of 9.3 cubic feet. Make the following calculations.

How many cubic feet of sand/peat mix will be required to install the shrubs?

- A. 90 cubic feet
- B. 87 cubic feet
- C. 43.5 cubic feet**
- D. 180 cubic feet

$10 \times 18 = 180$ cubic feet of soil excavated

$9.3 \times 10 = 93$ total ball volume

$180 - 93 = 87$ backfill volume

$87 / 2 = 43.5$ cubic feet of sand/peat mix required

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Problem Seven

Assume you have been assigned the task of retail pricing a shipment of roses. Your shop was billed \$828 wholesale for 20 bundles, 36 roses per bundle. Your employer operates on a 3.5 to 1 markup on cut flowers. Use the Retailers' Markup Chart to determine the per rose and per dozen retail price for the roses. Round up to the nearest \$0.001.

A. \$59.00 per dozen; \$4.92 ea.

B. \$62.10 per dozen; \$5.18 ea.

C. \$69.00 per dozen, \$5.75 ea.

D. \$23.00 per dozen; \$1.92 ea.

20 bundles @ 36 roses per bundle = 720 individual roses

$\$828 / 720 = \1.15 per rose

$3 \times \$16.20 + \$13.50 = \$62.10$ retail price per dozen

$\$63.10 / 12 = \5.18 retail price per rose

or

$4 \times \$13.50 + \$8.10 = \$62.10$ retail price per dozen

$\$63.10 / 12 = \5.18 retail price per rose

Retailers Markup Chart *

You Pay per flower	100% Markup	150% Markup	200% Markup	250% Markup	300% Markup	350% Markup	400% Markup
0.02	0.48	0.60	0.72	0.84	0.96	1.08	1.20
0.03	0.72	0.90	1.08	1.26	1.44	1.62	1.80
0.04	0.96	1.20	1.44	1.68	1.92	2.16	2.40
0.05	1.20	1.50	1.80	2.10	2.40	2.70	3.00
0.06	1.44	1.80	2.16	2.52	2.88	3.24	3.60
0.07	1.68	2.10	2.52	2.94	3.36	3.78	4.20
0.08	1.92	2.40	2.88	3.36	3.84	4.32	4.80
0.09	2.16	2.70	3.24	3.78	4.32	4.86	5.40
0.10	2.40	3.00	3.60	4.20	4.80	5.40	6.00
0.11	2.64	3.30	3.96	4.62	5.28	5.94	6.60
0.12	2.88	3.60	4.32	5.04	5.76	6.48	7.20
0.13	3.12	3.90	4.68	5.46	6.24	7.02	7.80
0.14	3.36	4.20	5.04	5.88	6.72	7.56	8.40
0.15	3.60	4.50	5.40	6.30	7.20	8.10	9.00
0.16	3.84	4.80	5.76	6.72	7.68	8.64	9.60
0.17	4.08	5.10	6.12	7.14	8.16	9.18	10.20
0.18	4.32	5.40	6.48	7.56	8.64	9.72	10.80
0.19	4.56	5.70	6.84	7.98	9.12	10.26	11.40
0.20	4.80	6.00	7.20	8.40	9.60	10.80	12.00
0.21	5.04	6.30	7.56	8.82	10.08	11.34	12.60
0.22	5.28	6.60	7.92	9.24	10.56	11.88	13.20
0.23	5.52	6.90	8.28	9.66	11.04	12.42	13.80
0.24	5.76	7.20	8.64	10.08	11.52	12.96	14.40
0.25	6.00	7.50	9.00	10.50	12.00	13.50	15.00
0.26	6.24	7.80	9.36	10.92	12.48	14.04	15.60
0.27	6.48	8.10	9.72	11.34	12.96	14.58	16.20
0.28	6.72	8.40	10.08	11.76	13.44	15.12	16.80
0.29	6.96	8.70	10.44	12.18	13.92	15.66	17.40
0.30	7.20	9.00	10.80	12.60	14.40	16.20	18.00

You Pay per Bunch	1.00 Markup	1.50 Markup	2.00 Markup	2.50 Markup	3.00 Markup	3.50 Markup	4.00 Markup
0.50	1.00	1.25	1.50	1.75	2.00	2.25	2.50
0.75	1.50	1.88	2.25	2.63	3.00	3.38	3.75
1.00	2.00	2.50	3.00	3.50	4.00	4.50	5.00
1.25	2.50	3.13	3.75	4.38	5.00	5.63	6.25
1.50	3.00	3.75	4.50	5.25	6.00	6.75	7.50
1.75	3.50	4.38	5.25	6.13	7.00	7.88	8.75
2.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
2.25	4.50	5.63	6.75	7.88	9.00	10.13	11.25
2.50	5.00	6.25	7.50	8.75	10.00	11.25	12.50
2.75	5.50	6.88	8.25	9.63	11.00	12.38	13.75
3.00	6.00	7.50	9.00	10.50	12.00	13.50	15.00
4.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00
5.00	10.00	12.50	15.00	17.50	20.00	22.50	25.00

*Determine the markup you want to charge, and this chart will give you the selling price per dozen (top chart) or per bunch (bottom chart)

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Problem Eight

Assume you are responsible for ordering potting soil for bedding plant production in the greenhouse operation you are employed in. The potting soil comes in 3 cubic foot bags. Use the chart below to determine the number of bags to order to fill the following standard round pots and cell packs. Round your answer up to the next whole bag of potting soil.

- 600 ea. standard cell packs (8-6 cell packs per tray)
- 1,000 ea. 4" standard round pots
- 500 ea. 6" standard round pots

Bags of potting soil to order:

- A. 52
- B. 134
- C. 10
- D. 70

600 standard cell packs / 5.9 packs per cubic foot / 3 cubic feet per bag = 34 bags

1,000 standard round pots / 48 pots per cubic foot / 3 cubic feet per bag = 7 bags

500 standard round pots / 16 pots per cubic foot / 3 cubic feet per bag = 11 bags

Total = 52 bags

Pot Size (in)	Approximate Dimension Top x Depth x Bottom (in)	Number of Pots/ft ³	Type	Approximate Dimension Top x Depth x Bottom (in)	Units/ft ³
Standard Round Pots					
2¼	2¼ x 2 ¹ / ₁₆ x 1¾	256	Germination tray	11½ x 21¼ x 1 ¹ / ₈	7.0
2½	2 ³ / ₈ x 2¼ x 2	208	20-row Seeding tray	11½ x 21¼ x 1 ¹ / ₈	11.0
Standard Cell-Packs					
3	3 x 2 ¹³ / ₁₆ x 2¼	120			
3½	3 ³ / ₈ x 3 ³ / ₁₀ x 2 ³ / ₈	80	8-4 cell packs per tray		5.4
4	4 x 3 ⁷ / ₈ x 2 ³ / ₄	48	8-6 cell packs per tray		5.9
4½	4 ³ / ₈ x 4 ³ / ₈ x 3	40	10-4 cell packs per tray		6.2
5	5 x 3½ x 4	28	10-6 cell packs per tray		6.7
5½	5½ x 5 ³ / ₈ x 3 ¹³ / ₁₆	20	12-4 cell packs per tray		6.0
6	6 x 5¾ x 4 ¹ / ₁₆	16	12-6 cell packs per tray		7.0
7	6¾ x 7¾ x 4 ¹¹ / ₁₆	10	Standard size 11¼ x 21¼ x 2		

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Problem Nine

Assume you are a sales person in a retail florist shop. A customer brings the following merchandise to you to check out:

1 roll	ribbon	priced @	\$8.75 ea.
3 ea.	plastic robins	priced @	\$5.80 ea.
1 ea.	wreath	priced @	\$18.98 ea.
6 ea.	roses	priced @	\$3.25 ea.
Total			_____
sales tax 0.0825 %			_____
TOTAL DUE			_____

The electrical power is off and you have to determine the amount of the sale and change due. The customer hands you a \$100.00 bill. Which of the following would be correct?

- A. Your total is \$69.96. Your change is: 4 pennies (\$69.70), 1 nickel (\$69.75), 1 quarter (\$70.00), 1 ten (\$80.00) and 1 twenty (\$100.00). Thank you.
- B. Your total is \$69.96. Your change is: 4 pennies (\$70.00), 1 ten (\$80.00) and 1 twenty (\$100.00). Thank you.**
- C. Your total is \$64.63. Your change is: 2 pennies (\$64.70), 1 nickel (\$64.75), 1 quarter (\$65.00), 1 five (\$70.00), 1 ten (\$80.00) and 1 twenty (\$100.00). Thank you.
- D. Your total is \$64.63 Your change is: 2 pennies (\$64.75), 1 dime (\$64.75), 1 quarter (\$70.00), 1 ten (\$80.00) and 1 twenty (\$100.00). Thank you.

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Problem Ten

Assume your employer is installing a new quonset-type greenhouse with a covering width of 34' and a length of 100'. It is to be a metal frame greenhouse and is to be covered with a double thickness plastic cover. It is to be designed for a wind velocity of 20 miles per hour and a inside-to-outside-temperature difference of 50° Fahrenheit. Use Tables 9, 10, and 12 provided to determine the total heat loss for the greenhouse in MBtu/hr.

standard heat loss (Table 3-12) x K (Table 3-9) x C (Table 3-10) = corrected heat loss (MBtu/hr)

- A. 280.651 MBtu/hr
- B. 165.734 MBtu/hr
- C. 314.751 MBtu/hr
- D. 150.192 MBtu/hr**

**Table 3-9 Climate Factors (K) for Various Average Wind Velocity and Temperature Conditions
50° Fahrenheit Inside-Outside Temperature Difference & 20 mph Wind Velocity = 0.72**

Table 3-10 Greenhouse Construction Factors (C) for the Common Type of Greenhouses = 0.70

**Table 3-12 Standard Heat-Loss Values for Quonset-Type Greenhouses = 269 Covering Loss
= 29 Combined End Loss**

$$29 \times .72 \times .70 = 14.616$$

$$269 \times .72 \times .70 = 135.576$$

Total heat loss in MBtu/hr = 150.192

Table 3-9 Climate Factors (K) for Various Average Wind Velocity and Temperature Conditions¹

<i>Inside-to-Outside Temperature Difference in °F (°C)</i>	<i>Wind Velocity in mph (m/sec)</i>				
	15 (6.7)	20 (8.9)	25 (11.2)	30 (13.4)	35 (15.6)
30 (16.7)	.41	.43	.46	.48	.50
35 (19.4)	.48	.50	.53	.55	.57
40 (22.2)	.55	.57	.60	.62	.64
45 (25.0)	.62	.65	.67	.70	.72
50 (27.8)	.69	.72	.74	.77	.80
55 (30.6)	.77	.80	.83	.86	.89
60 (33.33)	.84	.88	.91	.94	.98
65 (36.1)	.92	.96	.991	1.03	1.07
70 (38.9)	1.00	1.04	1.08	1.12	1.16
75 (41.7)	1.08	1.12	1.17	1.21	1.25
80 (44.4)	1.16	1.21	1.26	1.30	1.35
85 (47.2)	1.25	1.30	1.35	1.40	1.45
90 (50.0)	1.33	1.38	1.44	1.49	1.54

¹Standard heat-loss values from Tables 3-7, 3-8, and 3-12 are multiplied by a factor (K) to correct them from local wind and temperature conditions.

Table 3-10 Greenhouse Construction Factors (C) for the Common Types of Greenhouses

<i>Type of Greenhouse</i>	C
All metal (tight glass house-20-24" [51 or 61 cm] glass width)	1.08
Plastic-covered house (single thickness)	1.00
Plastic-covered house (double thickness)	0.70
Corrugated single-layer polycarbonate on metal	1.00
Acrylic or polycarbonate twin-wall panel 8mm thick	0.65
Acrylic or polycarbonate twin-wall panel 16 mm thick	0.58

Table 3-12 Standard Heat-Loss Values for Quoset-Type Greenhouses for the Combined Ends and for the Entire Covering Along the Length of the Greenhouse¹

		Covering Width in ft (m)											
		18	20	22	24	26	28	30	32	34	36	38	40
		(5.5)	(6.1)	(6.7)	(7.3)	(7.9)	(8.5)	(9.1)	(9.8)	(10.4)	(11.0)	(11.6)	(12.2)
		End Loss in MBtu/hr											
<i>House Length</i>													
<i>in ft (m)</i>		8	10	12	15	17	20	23	26	29	33	36	40
5 (1.5)		7	8	9	9	10	11	12	13	13	14	15	15
10 (3.0)		14	16	17	19	21	22	24	25	27	28	30	32
20 (6.1)		28	32	35	38	41	44	47	51	54	57	60	63
30 (9.1)		43	47	52	57	62	66	71	76	81	85	90	95
40 (12.2)		57	63	70	76	82	89	95	101	103	114	120	127
50 (15.2)		71	79	87	95	103	111	119	127	134	142	150	158
60 (18.3)		85	95	104	114	123	133	142	152	161	171	180	190
70 (21.3)		100	111	122	133	144	155	166	177	188	199	211	222
80 (24.4)		114	127	139	152	174	177	190	202	215	228	240	253
90 (27.4)		128	142	157	171	185	199	214	228	242	256	271	285
100 (30.5)		142	158	174	190	206	221	237	253	269	285	301	316
200 (61.0)		285	316	348	380	411	443	475	506	538	570	601	633
300 (91.4)		427	475	522	569	617	664	712	759	807	854	902	949
400 (121.9)		570	633	696	759	822	886	949	1,012	1,075	1,139	1,202	1,265
500 (152.4)		712	791	870	949	1,028	1,107	1,187	1,265	1,345	1,424	1,503	1,582

¹These values are for standard conditions, including a 70° F (39° C) difference from outside to inside temperature and an average wind velocity of 15 mph (6.7 m/sec).

2011 National FFA Floriculture
Career Development
General Knowledge Exam
Answer Sheet

- Plants convert chemical energy into light energy which results in plant growth.
a. true b. false
- Wavelengths are measured in _____ with specific wavelengths corresponding to specific _____.
a. nanometers, color b. kilometers, size
c. centimeters, weight d. pedometers, width
- Photoperiodism is a phytochrome-mediated response.
a. true b. false
- Modern _____ cultivars come in an astonishing variety of colors, color combinations and petal styles (spoon, quill, and flat).
a. dianthus caryophyllus (carnations) b. Helianthus annus L. (sunflower)
c. chrysanthemum (daisy) d. dahlias
- Dahlias are native to the mountains of _____.
a. Mexico b. Switzerland
c. Ireland d. New England
- Growth is best for Helianthus annus L. between _____ and _____ sun is always preferred.
a. 75 to 85 F, full b. 45 to 65 F, partial
c. 55 to 75 F, partial d. 65 to 75 F, full
- _____ is an example of a species that is commercially cultivated.
a. Seed hydration b. Exacum affine
c. Stratification d. Scarification
- When spores germinate, they form a small _____ leaf like structure known as the prothallus.
a. black b. yellow
c. green d. brown
- _____ is any method of breaking through hard, water-impermeable seed coats to allow water to penetrate.
a. Seed hydration b. Exacum affine

c. Stratification

d. Scarification

10. Disadvantages to Pregermination are limited shelf life of _____, limited selection, and limited cost.
a. 6 to 8 weeks b. 4 to 5 days
c. 4 to 5 weeks d. 6 to 8 days
11. Floral supply companies focus their inventories on hard goods and tools but primarily on fresh flowers and foliage.
a. true b. false
12. _____ were historically the first people to use flowers for decorative purposes.
a. Egyptians b. Japanese
c. Europeans d. Greeks and Romans
13. The strewing of flowers and loose petals at banquets and festivals was typical of the _____ period.
a. Egyptian b. Greek and Roman
c. Japanese d. Italian Renaissance
14. The _____ period is considered the beginning of the flower arranging as it is known today.
a. Egyptian b. Greek and Roman
c. Japanese d. Italian Renaissance
15. The point at which the plant is receiving as much light energy as it can use is the _____ point.
a. light completion b. light saturation
c. light compensation d. light fabrication
16. The Euphorbia pulcherrima a _____ day plant, is induced to flower by providing _____ nights and _____ days.
a. long, short, long b. short, short, long
c. short, long, short d. long, long, short
17. The floral industry is an international, multitrillion dollar industry.
a. true b. false

18. The floral design of the _____ influence emphasizes careful and significant placement of every flower, branch or leaf.
- a. Egyptians
 - b. Greeks and Romans
 - c. Japanese
 - d. Italians
19. Consumers encounter Alstroemeria frequently in the retail marketplace, as it is one of the World's top _____ cut flowers.
- a. fifteen
 - b. five
 - c. fifty
 - d. ten
20. The Antirrhinum majus is also known as the _____.
- a. Snapdragon
 - b. Poinsettia
 - c. Daisy
 - d. Carnation
21. Alstroemeria hybrids are also known as _____.
- a. Princess Lily
 - b. Iris
 - c. Snapdragon
 - d. Oriental Lily
22. Zantedeschia rehmannii, Z. elliotiana, Z. hybrids also known as _____.
- a. Christmas Lily
 - b. Peace Lily
 - c. Easter Lily
 - d. Calla Lily
23. Iron deficiency, identified by blackening or interval chlorosis of young leaves, is the primary problem for plants growing in a low pH medium.
- a. true
 - b. false
24. Seed-grown tubers generally produce _____ eyes, which mean plants will have a _____ number of flowers and leaf spouts.
- a. fewer, higher
 - b. more, higher
 - c. more, lower
 - d. fewer, lower
25. Most Callas sold today from the United States are three year old true seed hybrids.
- a. true
 - b. false
26. Floriculture is defined literally as " _____ " but includes florist shops, flower retailers, wholesale florist, production greenhouses and floral supply companies.

a. culture of flowers
c. culture of horticulture

b. industry of flowers
d. culture of floral arranging

27. _____ provides even faster seedling production than other hydration methods and results in 100% usable seedlings.

a. seed hydration
c. matriconditioning

b. mechanization treatments
d. Pregermination

28. The _____ point is the light intensity at which the plant is receiving as much energy from the light during photosynthesis as it is during respiration.

a. light completion
c. light compensation

b. light saturation
d. light fabrication

29. Although general plant growth usually requires light with all wavelengths _____ and _____ wave lengths result in the greatest plant growth response.

a. yellow (580nm), green (530nm)
c. red (700), blue (470)

b. green (530), purple (530)
d. yellow (580), blue (280)

30. The Italian Renaissance was significant during the _____ centuries.

a. 17th and 18th
c. 12th and 13th

b. 15th and 16th
d. 14th and 15th

31. The placement of three main flowers or branches signifies _____, _____, and _____.

a. man, woman, child
c. emotion, wealth, family

b. earth, love, family
d. heaven, man, earth

32. Place cut *Antirrhinum majus* stems vertically as soon as possible after harvest; stems placed horizontally may begin to bend upward in as little as _____.

a. 30 minutes
c. 2 hours

b. 5 hours
d. 60 minutes

33. When the source of _____ is removed, the concentration of the _____ drops quickly, thereby releasing lateral branches from _____ dominance and allowing them to develop.

a. auxin, inhibitory, apical
c. tunic, hormone, atypical

b. tunic, potassium, atypical
d. auxin, hormone, apical

34. _____ is similar to seed hydration except the process is allowed to progress

further until the seed coat splits and the radical becomes visible.

- a. micropropagation
- b. mechanization treatments
- c. stratification
- d. Pregermination

35. _____ is a technique used by seed suppliers to imbibe the seed and begin germination, but then stop the process before the radical (root) emerges.

- a. seed hydration
- b. mechanization treatments
- c. matricconditioning
- d. Pregermination

36. Stratification is the application of a moist chilling treatment of 32 to 50 F (0 to 10 C) to seeds.

- a. true
- b. false

37. The _____ fuzzy fungal growth of Botrytis often begins with injured or necrotic areas and then infects healthy tissue.

- a. white
- b. black
- c. gray
- d. brown

38. Measuring light requires the use of _____ factor(s).

- a. 1
- b. 5
- c. 4
- d. 3

39. Light has _____ function(s) in plant growth.

- a. one
- b. three
- c. two
- d. four

40. Helianthus annus L. is the most commonly grown _____ species.

- a. carnations
- b. snapdragons
- c. poinsettia
- d. sunflowers

41. Dianthus caryophyllus is a native of the _____ area, originally flowering only in the early spring.

- a. Mediterranean
- b. Bahamas
- c. South America
- d. Central America

42. Dahlias flower morphology is complex and flower size varies from larger than _____ to less than _____ in diameter.

- a. 10.25 in., 9 in.
- b. 8.25 in., 4 in.
- c. 9.25 in., 6 in.
- d. 7.75 in., 3.75in.

43. Plants grown under light high in _____ wavelengths will be short, dark green, and well branched.
- a. blue
 - b. green
 - c. red
 - d. yellow
44. Sunflowers require low nutritional levels.
- a. true
 - b. false
45. Treated seed virtually _____ viral, fungal, and bacterial disease at the time of planting, greatly _____ disease in professional grower products.
- a. creates, eliminating
 - b. initiates, increasing
 - c. creates, increasing
 - d. eliminates, reducing
46. There are two different purposes for using artificial lighting. First, lamps can be used to provide additional light to increase photosynthesis and plant growth. This is termed _____ lighting. Second, lamps can be used to alter the photoperiod perceived by the plants. This is termed _____ lighting.
- a. high, frame
 - b. secondary, illusion
 - c. supplemental, photoperiodic
 - d. synthetic, capturing
47. Many growers apply a shading compound or shade cloth from _____ to _____ to reduce heat stress that results from high light levels entering the greenhouse.
- a. late spring, early fall
 - b. early fall, early spring
 - c. late summer, late fall
 - d. late winter, early summer
48. Alstroemeria produce two types of shoots _____ and _____.
- a. nonflowering, vegetative
 - b. staggered, flowering
 - c. flowering, vegetative
 - d. upright, nonflowering
49. Botrytis blight is also known as _____.
- a. Calla delight
 - b. tulip fire
 - c. Rose Midge
 - d. daffodil delight
50. Sympathy flowers are important to _____ the deceased and _____ the living.
- a. grieve, inspire
 - b. grieve, express
 - c. express, remind
 - d. honor, comfort

**2012 National FFA
Floriculture Career Development Event**

**GENERAL KNOWLEDGE EXAM
ANSWER SHEET**

1. Nontraditional 20th Century flower arranging styles can be arbitrarily divided into two types known as Radial Structure and the interest-equated style, based on the method of construction.
a. **True** b. False
2. The difference between an informal boutonniere and a formal boutonniere is the informal boutonniere has a green piece attached behind the flower held in place with floratape.
a. True b. **False**
3. Linear materials are those that grow into the shape of a tall spire or spike. They are usually tall and slender. Often they are _____ below the tip but taper definitely to a point at the top, much like a _____.
a. fluffy, ice cream cone b. **full, church steeple**
c. round, mountain peak d. full, mountain peak
4. The American style of flower arranging is based on the _____ elements of design.
a. 2 b. 4 c. **6** d. 7
5. What are the three kinds of traditional flower arrangements recognized today in America by flower arrangers and the National Council of State Garden Clubs?
a. **line, mass, line-mass** b. line, naturalistic, abstract
c. naturalistic, free-form, abstract d. free-form, abstract, mass
6. The famous painter della Robbia is remembered for his symmetrical treatments of wreaths and garlands made of dull colored fruits, peppers, cones, berries, foliage, and flowers.
a. True b. **False**
7. Who first developed the "rules" of the floral design?
a. French of the Industrial Era b. Indians of the Columbus Era
c. Greeks of the Roman Era d. **English of the Victorian Era**

8. What are the four types or shapes of plant material?
- a. circle, square, rectangle, pyramid b. line, form, square, balance
 c. shape, mass, symmetrical, triangle d. **line, form, mass, filler**
9. The art of any period of civilization reflects the tastes and ideas of that time and place. In general, _____ and _____ flower arrangements have emphasized mass and color.
- a. China, Japan b. Georgian, Victorian
 c. **Mediterranean, Europe** d. Renaissance, French
10. The French Period was from _____.
- a. 1550-1760 b. 1400-1600
 c. 475-1400 d. **1715-1800**
11. During the French Period, the court life, beginning with King Louis XIV (1638-1715) in France, greatly influenced the art forms of Europe in the late 17th and 18th centuries. The tone was one of luxury, magnificence, and elegance, but the styles of flower _____ and _____ were characterized by mild restraints.
- a. **painting, arranging** b. cascading, arranging
 c. curves, motifs d. shells, scrolls
12. Dahlias flower morphology is simple and flower size varies from larger than 9.25 in. to less than 4 cm.
- a. True b. **False**
13. Boutonnieres and corsages are supplemental to apparel and should accent the clothing, not detract from it while the flowers used should reflect the time of year or season, not the event or reason for the celebration.
- a. True b. **False**
14. _____ is represented by strong geometric lines and forms. They are highly stylized and are often thought to mimic Egyptian and Aztec cultures as well as being influenced by the contemporary society.
- a. Art Nouveau b. Art Bonified
 c. Art Classified d. **Art Deco**

15. _____ is curvilinear lines, cascading works, with nature's patterns of plants and flowers depicted either in the arrangement or in the container.
- a. **Art Nouveau**
 - b. Art Bonified
 - c. Art Classified
 - d. Art Deco
16. The most common type of florist ribbon used is a waterproof _____ with a _____ edge.
- a. unsanitized acetate, fused
 - b. nylon ribbon, round
 - c. **sanitized acetate, fused**
 - d. nylon ribbon, sharp
17. Tertiary colors are the _____ mixture of a primary and secondary color next to it.
- a. unequal
 - b. 1:2 ratio
 - c. 3:1 ratio
 - d. **equal**
18. _____ harmony combines three colors equi-distant on the wheel forming a triangle such as red, blue, and yellow.
- a. Tetrad
 - b. **Triadic**
 - c. Complementary
 - d. Monochromatic
19. The most important consideration in setting up an irrigation system is water _____.
- a. pressure
 - b. concentration
 - c. **quality**
 - d. volume
20. One of the most important factors is the electrical conductivity (EC), a measure of soluble salts. Water with a low EC, _____ mS/cm, will give the greatest number of irrigation options and will help reduce future problems from the accumulation of high soluble salts in the root medium.
- a. 6.0-7.0
 - b. 0.8-2.0
 - c. **0.1-0.5**
 - d. 2.0-2.8
21. Foliar analysis is especially useful when you need to determine _____ levels in the plant.
- a. **micronutrient**
 - b. macronutrient
 - c. both a and b
 - d. neither a or b

22. The _____ the alkalinity level, the _____ the pH of soilless medium will _____.
- a. lower, slower, decrease b. higher, slower, increase
- c. **higher, quicker, increase** d. lower, quicker, decrease
23. Each plant has an optimum temperature range. In general, if you were to lump all floriculture crops together, you would find the optimum range is from 35-50°F (2-10°C) on the lower side and _____°F (_____°C) on the upper side.
- a. 55-70, 12-17 b. **65-85, 18-29**
- c. 51-64, 11-19 d. 75-90, 30-40
24. During propagation, such as seed germination and plug seedling production, and in liner (rooted cutting) production, temperatures are _____ than they are during finished crop production.
- a. **higher** b. lower _____
- c. inconsistent d. none of the above
25. Temperature is the only way you will control how quickly your plants grow.
- a. True b. **False**
26. Bonzi is one of the more _____ PGRs (plant growth regulators).
- a. inactive b. differential
- c. limited d. **active**
27. For the traditional florist, the term “_____” is meant to promote the sale of flowers by offering a variety of products in a variety of ways.
- a. flower design b. wholesale
- c. retailer d. **marketing**
28. _____ is a philosophy, a way of thinking that puts the consumer at the center of attention.
- a. **Marketing** b. Retailing
- c. Floral designing d. none of the above
29. In the 1980s, “Architectural” arrangements that were angular and linear took the place of the “_____”.
- a. Square-Bails b. Circular- Pillars
- c. **Round-Moundy’s** d. none of the above

30. Roses require special handling and, after cutting stems _____, they should be placed in a commercially available _____ solution which _____ the water acidity and speeds the uptake of water.
- a. underwater, preservative, raises b. horizontally, preservative, lowers
 c. **underwater, hydrating, lowers** d. none of the above

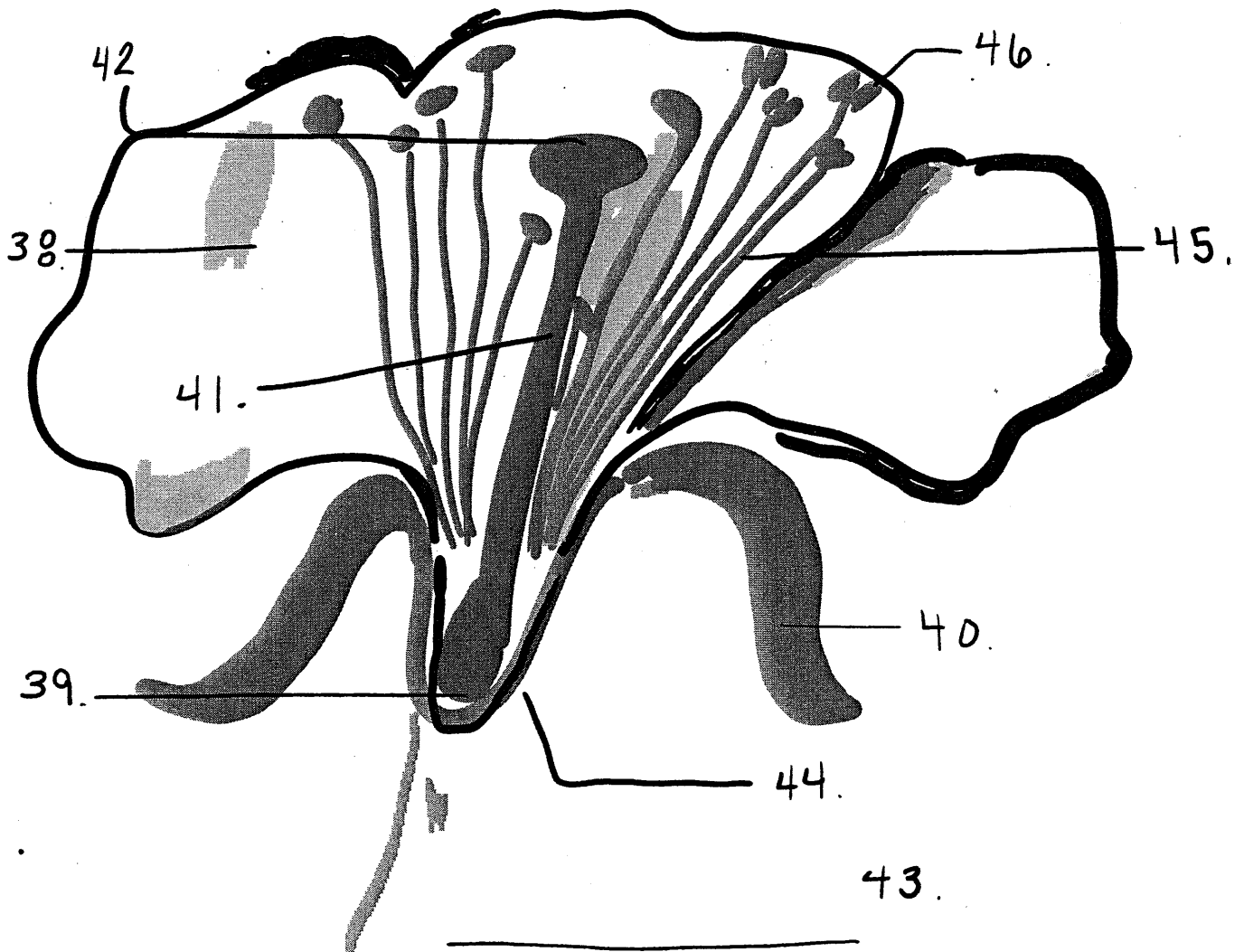
For questions 31 through 33, match the following terms to the description:

- a. Wood Picks b. Metal Picks c. Water Picks d. Designer Pick

31. (c.) are green plastic tube-like reservoirs with rubber caps, into which the flower stem is inserted.
32. (b.) attached with a heavy-duty picking machine. A sharp, pointed, barbed shaft is attached to the flower or foliage.
33. (a.) available in green and natural colors. They are pointed on one end for easy insertion with or without attached wires on the other end.
34. _____ involve tubing that provides water to individual pots.
- a. Flow benches **b. Spaghetti tubes**
 c. Tray mechanization d. Capillary mats
35. _____ is obtained from nature and is the result of weathered rocks.
- a. Plant nutrition b. Macro-nutrients
 c. **Mineral soil** d. none of the above
36. Calcium, magnesium, and sulfur are said to be _____ macro-nutrients because plants need moderate amounts.
- a. primary **b. secondary**
 c. slow release d. none of the above
37. Plant growth is dependent on _____ essential elements, often referred to as nutrients.
- a. 9 b. 13 c. 3 **d. 17**

Use the diagram below to identify 38 through 46:

- | | | | | |
|-----|-------------|---------------|---------------|---------------|
| 38. | a. petal | b. style | c. stigma | d. pedicel |
| 39. | a. style | b. ovary | c. filament | d. anther |
| 40. | a. petal | b. stigma | c. sepal | d. receptacle |
| 41. | a. stigma | b. ovary | c. sepal | d. style |
| 42. | a. anther | b. stigma | c. filament | d. pedicel |
| 43. | a. pedicel | b. receptacle | c. ovary | d. sepal |
| 44. | a. filament | b. anther | c. receptacle | d. style |
| 45. | a. style | b. petal | c. stigma | d. filament |
| 46. | a. sepal | b. anther | c. style | d. ovary |



47. The chief function of the leaves is food manufacture. This process of food manufacture is called photosynthesis. **carbon dioxide + water** $\xrightarrow{\text{light}}$ **glucose + oxygen**
(in the presence of chlorophyll)

What is the correct equation?

- a. $6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
- b. $2\text{CO}_2 + 2\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_6\text{H}_6\text{O}_2 + 6\text{O}$
- c. $4\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow{\text{light}} \text{C}_2\text{H}_{12}\text{O}_2 + 6\text{O}$
- d. none of the above
48. Poinsettia's history shows that Poinsettias represented purity and served as a reminder of the blood sacrifices to the Aztec people.
- a. **True** b. False
49. National Poinsettia Day is December _____, the anniversary of the death of Joel Robert Poinsett.
- a. 19 b. 5 c. 12 d. 21
50. _____ is a feathered single flower made from the florets of a gladiolus flower.
- a. Tendril b. Bias
- c. Var d. **Glamellia**

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50. Teaching Floral Design (A Hands-On Approach), p. 4

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c) texture, fluffer leaf

d) depth, height

42) The temperature that benefits the majority of the flowers held by a florist is 35°-40° F _____ °C)

a) 4°, 4.5°

b) 7°, 12°

c) 5°, 7.5°

d) 15°, 17°

43) The size of the wire is listed according to its gauge number. The higher the gauge number, the _____ wire.

a) heavier

b) lighter

c) **finer**

d) none of the above

44) Several different types of grafting have been developed including _____, splice, side, _____, side-veneer, cleft, bark, and approach grafting.

a) swirl (tongue), budding

b) whip (tongue), ring (annular)

c) T (shield), inverted T

d) **whip (tongue), side-tongue**

45) Soluble salts refer to the total dissolved ions in media water solutions. Soluble salts are measured by means of electrical conductivity (EC); the lesser the soluble salt concentration, the more easily an electrical current will pass through a medium water solution.

a) True

b) **False**

- 46) _____ are/is the fiber of a palm tree used like string or ribbon to tie things together.
- a) Salal leaves
b) Cornucopia
c) **Raffia**
d) none of the above
- 47) _____, commonly called _____ throughout the trade, is the traditional filler flower for mixed bouquets and arrangements.
- a) Gladiolus, gla
b) Gloxinia, Glox
c) Godetia, Gode
d) **Gypsophila, gyp**
- 48) Sunflower is also known as _____.
- a) **Helianthus**
b) Helichrysum
c) Heliotropium
d) Hemerocallis
- 49) Daylily also known as _____.
- a) Helianthus
b) Helichrysum
c) Heliotropium
d) **Hemerocallis**
- 50) Amaryllis also known as _____.
- a) Hosta spp.
b) **Hippeastrum hybrids**
c) Hydrangea
d) Hibiscus moscheutos/H. hybrids

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**2013 National FFA
Floriculture Career Development Event**

**GENERAL KNOWLEDGE EXAM
ANSWER SHEET**

- 1) A _____ is defined as having a _____ occurring, unique set of characteristics and is separated from other closely related species by location, flowering time, and so on.
- a) **plant species, naturally** b) commercial plant, unnatural
c) root system, naturally d) plant species, fabricated
- 2) The unique characteristics of a species are usually transmitted to the next generation through _____ or _____.
- a) roots, bulbs b) **seeds, soil**
c) seeds, spores d) spores, bulbs
- 3) Scarification is the only method of breaking through hard, water-impermeable seed coats to allow water to penetrate.
- a) True b) **False**
- 4) Mineral soil is _____ to _____ times heavier than the other components used in growing media.
- a) 2, 3 b) 7, 49
c) **10, 50** d) 1, 10
- 5) One mold can harm your crop by preventing water from penetrating into the mix. This fungus is found in pine bark storage piles and has a gray threadlike structure (mycelium) that repels water.
- a) **True** b) False

- 6) There are several mold genera that are found in bark. The most problematic is a(n) _____ slime mold.
- a) ZeroTol
 - b) Perlite
 - c) Vermiculite
 - d) **Ostracoderma**
- 7) Growers commonly use three types of pinches: _____, _____ and _____.
- a) **soft pinch, hard pinch, cutting back**
 - b) angled pinch, quick pinch, sharp pinch
 - c) deep pinch, general pinch, forward cutting
 - d) early pinch, mid-pinch, high pinch
- 8) New businesses should realize that it usually requires _____ for the business to show a profit and owners should plan accordingly.
- a) 3 to 5 months
 - b) 1 to 3 years
 - c) 15 to 24 months
 - d) **3 to 5 years**
- 9) The common name for an Achimenes hybrid is _____.
- a) Monkshood
 - b) Kangaroo-paw
 - c) Anemone
 - d) **Hot water plant**
- 10) Potted flowering plants must have sufficient stems, foliage, flowers and spuds to provide an attractive display.
- a) True
 - b) **False**
- 11) Cut flowers must have sufficiently short and flexible stems, appropriately sized flowers and enough flowers and foliage.
- a) True
 - b) **False**

- 18) b : Symptoms can begin as incomplete formation of flower parts such as fewer petals, small petals, sudden wilting; or collapse of petals, and notches of tissue missing in flower stems, leaf petioles, or stems.
- 19) d : The margins of older leaves become necrotic with a characteristic reddish-brown color. Necrotic spots may also develop across the leaf blade but tend to be concentrated at the margins.
- 20) a : Young leaves develop interveinal chlorosis, however, the tips and lobes of these leaves may remain green. Next, the youngest fully expanded leaves rapidly become necrotic. The sudden death of these leaves resembles desiccation.
- 21) For most floriculture crops, the average daily temperature (ADT) primarily controls flowering.
- a) **True – for temperatures maintained within the broad optimum temperatures range of 50°-85°F (10°-20°C)**
- b) True – for temperatures maintained within the broad optimum temperatures range of 29°-49°F (30°-49°C)
- c) True – for temperatures maintained within the broad optimum temperatures range of 85°-100°F (10°-29°C)
- d) False
- 22) The ADT formula is:
- a) $ADT = (\text{day temperature} \times \text{hours}) + (\text{night temperatures} \times \text{hours}) + 12$
- b) $ADT = (\text{day temperature} - \text{hours}) \times (\text{night temperatures} + \text{hours}) \div 24$
- c) $ADT = (\text{day temperature} \times \text{hours}) - (\text{night temperatures} \times \text{hours}) \times 12$
- d) **$ADT = (\text{day temperature} \times \text{hours}) + (\text{night temperatures} \times \text{hours}) + 24$**
- 23) During photosynthesis, plants take water (H₂O) from the soil, carbon dioxide (CO₂) from the air, and energy contained in sunlight to create sugars that can be moved within the plant to provide fuel for growth.
- a) **True** b) **False**

- 37) An S-shaped line mass design is a _____ curve.
- a) crescent
 - b) oval
 - c) naturalistic
 - d) **Hogarth**
- 38) The combination method employs a chenille stem inserted into the _____-inch stem of the flower.
- a) 2
 - b) $\frac{1}{2}$
 - c) 1
 - d) 4
- 39) A _____ is an area located in the lower half of the design that ties or visually pulls an arrangement together.
- a) **center of interest**
 - b) candelabra design
 - c) conical centerpiece
 - d) calyx
- 40) The cornucopia, or horn of plenty, has been used for centuries as a symbol of _____.
- a) fruitfulness
 - b) **abundance**
 - c) distinction
 - d) love
- 41) Unity is lacking when the arrangement cannot be divided into separate parts.
- a) True
 - b) **False**
- 42) The size of flower stem wire is listed according to its gauge number. The higher the gauge number, the finer the wire.
- a) **True**
 - b) False
- 43) An equilateral triangle-shaped arrangement will be as _____ as it is _____.
- a) round, tall
 - b) round, wide
 - c) **tall, wide**
 - d) short, round

- 44) The right-triangular, or asymmetrical, floral design is constructed in a manner similar to the _____ design.
- a) asymmetrical balance
 - b) **equilateral-triangle**
 - c) mechanical balance
 - d) triad
- 45) _____ makes an excellent centerpiece because it is attractive when viewed from either the front or the back.
- a) **Horizontal design**
 - b) Right triangle
 - c) Asymmetrical balance
 - d) Tuzzy-muzzy
- 46) The circular shape of the Colonial bouquet is very popular with brides. This style is fashioned after the nosegay designs of the English Georgian and earlier French handheld floral pieces called the _____.
- a) horizontal design
 - b) right triangle
 - c) asymmetrical balance
 - d) **Tuzzy-muzzy**
- 47) Ripening fruit, vegetables and decaying plant debris are all sources of ethylene gas—which can be harmful to Orchids.
- a) **True**
 - b) False
- 48) Filler flowers add a finishing touch to an arrangement. The two types of filler flowers used in flower arrangements are _____ and _____.
- a) feather, wax
 - b) **bunch, feather**
 - c) wax, bunch
 - d) none of the above
- 49) _____ is the formal temple style of Japanese floral design, characterized by the massive, symmetrical arrangement of flowers in bronze ceremonial vases.
- a) Shokwa
 - b) Soe
 - c) **Rikkwa**
 - d) Tai

50) _____ is the ancient Japanese floral style created by the Buddhist priest Senchin. These designs were constructed in an asymmetrical style in low, flat containers.

a) Shokwa

b) Soe

c) Rikkwa

d) Tai

Good Luck and Have Fun!!!!

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