A sample of asparagus, *Asparagus officinalis,* was received in the laboratory for testing. Answer the following questions pertaining to the sample.

1. Prior to receiving the sample, the customer asked you to take the sample for them. There are 49 bags in the lot. How many primary samples should be taken to obtain the working sample?

a. 5
b. 14
c. 10
d. 22

Section 1: Sampling
1.3 Obtaining a sample for submission
a. seed in containers (typically packaged in 60 pounds of less)
(3). For lots of more than six containers, sample five containers plus at least 10% of the numbers of containers in the lot. It is not necessary to sample more than 30 containers.

Number of containers in lot	Minimum number of containers to sample	Number of containers in lot	Minimum number of containers to sample	Number of containers in lot	Minimum number of containers to sample
1 - 4	1.3 a.(2) above	75 – 84	13	175 – 184	23
5	5	85 – 94	14	185 – 194	24
6	6	95 – 104	15	195 – 204	25
7 – 14	6	105 – 114	16	205 – 214	26
15 – 24	7	115 – 124	17	215 – 224	27
25 – 34	8	125 – 134	18	225 – 234	28
35 – 44	9	135 – 144	19	235 – 244	29
45 – 54	10	145 – 154	20	245 or more	30
55 – 64	11	155 – 164	21		
65 – 74	12	165 – 174	22		

2. How many decimal places should the working sample be weighed out to?

a. 0
b. 1
c. 2
d. 3
e. 4

1		*Asparagus officinalis* L. asparagus	100	500	25	710

Section 2: Preparation of working samples
2.3.a.

Weight of working sample in grams	Number of decimal places
Less than 1.000	4
1.000 to 9.999	3
10.00 to 99.99	2
100.0 to 999.9	1
1000 or more	0

3. What is the minimum weight needed for a purity test? __100g_____

1		*Asparagus officinalis* L. asparagus	100	500	25	710

4. What is the minimum weight needed for a noxious exam? ____500g_____

1		*Asparagus officinalis* L. asparagus	100	500	25	710

5. What Pure Seed Unit is used for asaparagus?

a. 1
b. 9
c. 2
d. 3
e.

1		*Asparagus officinalis* L. asparagus	100	500	25	710

6. True False A seed with the seed coat entirely removed is considered inert matter.

1	Seed, with or without seed coat. Piece of broken seed, with or without seed coat, larger than one-half the original size. Special considerations: * Seeds of Cucurbitaceae and Solanaceae whether or not they are filled. * Pairs of *Allium* spp. seeds adhering together need not be separated. Refer to section 6.5 c.

7. True False On top of creped cellulose paper without a blotter is an approved substrate for asparagus.

Asparagus officinalis asparagus	B, T, S	20-30	7	21		

B: between blotters
C: creped cellulose paper wadding (0.3-inch thick Kimpak or equivalent) covered with a single thickness of blotter through which holes are punched for the seed that are pressed for about one-half their thickness into the paper wadding
O: organic growing media
OT: organic growing media covering seed planted on top of paper toweling (T)
P: covered petri dishes or other rigid transparent containers, with appropriate layers of blotters, filter paper, paper toweling, creped cellulose paper, pleated paper or sand that provide adequate moisture to the seeds during the test period
PP: pleated filter paper (see footnote a in Table 6A)
PT: substrata listed for P with the following substrata also allowed: sponge rok, vermiculite, terralite, or a mixture of 50 percent sand and vermiculite, sand and perlite, etc.
~~**RB:** blotters and raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds~~
S: sand
T: paper toweling, used either as folded towel tests or as rolled towel tests in horizontal or vertical position
TB: top of blotters
TS: top of sand
TC: on top of creped cellulose paper without a blotter

8. What is the approved temperature for an asparagus germ test?

a. 20 C
b. 25 C
c. 20-30 C
d. 15 C

Kind of Seed	Substrata	(°C)	(days)	(days)	and notes	Dormant seed
Asparagus officinalis asparagus	B, T, S	20-30	7	21		

9. If the germ test is planted on October 5th, what day will the first count occur?

a. October 19
b. October 12
c. October 10
d. October 26

Kind of Seed	Substrata	(°C)	(days)	(days)	and notes	Dormant seed
Asparagus officinalis asparagus	B, T, S	20-30	7	21		

10. How many days from planting will the final count occur?

a. 7
b. 14
c. 10
d. 21

Kind of Seed	Substrata	(°C)	(days)	(days)	and notes	Dormant seed
Asparagus officinalis asparagus	B, T, S	20-30	7	21		

A sample of oats, *Avena sativa*¸ was received in the laboratory for testing. Answer the following questions pertaining to the sample.

11. What is the recommended minimum weight that should be submitted for the oat sample?

a. 60
b. 150
c. 500
d. 1000

Section 1.4

a. **The following are recommended minimum weights for samples of seed to be submitted for analysis, test, or examination. The required minimum submitted sample weights must be of sufficient size for the desired testing to be conducted. The required minimum sample weights are stated in AOSA Rules Vol. 1 section 1.4.a.(5-8) and section 2.4.**

(1) Sixty (60) grams (approximately 2 ounces) of grass seed not otherwise mentioned, alsike or white clover, or seeds not larger than these.

(2) One hundred fifty (150) grams (approximately 5 ounces) of alfalfa, crimson or red clover, flax, lespedezas, millet, rape, ryegrasses, or seeds of similar size.

(3) Five hundred (500) grams (approximately 1 pound) of proso millet, sudangrass, or seeds of similar size.

(4) One thousand (1,000) grams (approximately 2 pounds) of cereals, vetches, sorghums, or seeds of similar or larger size.

(5) Vegetable and flower seed samples (as categorized by the AOSA Rules for Testing Seeds Vol. 3. Uniform Classification of Weed and Crop Seeds) shall consist of at least 400, and preferably at least 800, seeds per sample. For official samples being obtained and submitted for regulatory compliance testing, the sample size shall be

12. True False The weight of the purity working sample cannot be considered part of the minimum weight specified for the noxious weed seed exam.

Section 2.3.b

b. **Purity analysis, noxious weed seed examination, bulk examination. –**

When a purity analysis is performed, the weight of the purity working sample may be considered part of the minimum weight specified for the noxious weed seed examination or bulk examination.

13. What is the minimum weight needed for a purity test? **75g**

14		*Avena sativa* L. oat and red oat	75	500	35-50	1,000-1,425

14. What is the minimum weight needed for a noxious test? **500g**

14		*Avena sativa* L. oat and red oat	75	500	35-50	1,000-1,425

15. True False Two oat seeds adhered together must be separated and classified appropriately as pure seed or inert matter.

14	Multiple floret spikelet, multiple floret, or floret, with or without awn(s), provided a caryopsis with some degree of endosperm development can be detected (either by slight pressure or by examination over light), see special consideration for *Hordeum vulgare.* Caryopsis or piece of broken caryopsis larger than one-half of the original size. Special consideration: For *Hordeum vulgare*: * A piece of broken floret or spikelet shall contain a caryopsis larger than one-half the original size. * Two or more attached spikelets shall be separated into single spikelets. * Attached rachis segments shall be removed and classified as inert matter.

16. True False To be considered a pure seed unit, there must be some degree of endosperm development present.

14	Multiple floret spikelet, multiple floret, or floret, with or without awn(s), provided a caryopsis with some degree of endosperm development can be detected (either by slight pressure or by examination over light), see special consideration for *Hordeum vulgare.* Caryopsis or piece of broken caryopsis larger than one-half of the original size. Special consideration: For *Hordeum vulgare*: * A piece of broken floret or spikelet shall contain a caryopsis larger than one-half the original size. * Two or more attached spikelets shall be separated into single spikelets. * Attached rachis segments shall be removed and classified as inert matter.

17. What test can be used to distinguish off types of oats from other oats?

a. cupric sulfate test
b. fluorescence test
c. peroxidase test
d. phenol test

Section 5.2.b.(1)

(1) **Fluorescence test for oat** (*Avena sativa*) **florets**: To determine the presence of varieties with fluorescent lemmas and paleas.

Place at least 400 florets on a black background under an F15T8-BLB or comparable ultraviolet tube(s) in an area where light from other sources is excluded. Florets are considered fluorescent if the lemma or palea fluoresce or appear light in color. "Partially fluorescent" florets shall be considered fluorescent. Florets are considered non-fluorescent if the lemma and palea do not fluoresce and appear dark in color under the ultraviolet light.

18. What part of the seed structure fluoresces?

a. Lemma and palea
b. Caryopsis and rachilla
c. Lemma and caryopsis
d. Caryopsis and palea

(1) **Fluorescence test for oat** (*Avena sativa*) **florets**: To determine the presence of varieties with fluorescent lemmas and paleas.

Place at least 400 florets on a black background under an F15T8-BLB or comparable ultraviolet tube(s) in an area where light from other sources is excluded. Florets are considered fluorescent if the lemma or palea fluoresce or appear light in color. "Partially fluorescent" florets shall be considered fluorescent. Florets are considered non-fluorescent if the lemma and palea do not fluoresce and appear dark in color under the ultraviolet light.

19. When a purity, germination, and noxious test are requested, where are the pure seed units for planting the germ obtained from?

a. Noxious working weight
b. Submitted sample
c. Bulk exam working weight
d. Pure seed from the purity

Section 6.1.a.(1)

(1) Seeds for the germination test shall be taken from the pure seed component of the purity analysis and shall be counted without discrimination as to size or appearance.

20. Predry requires you to place the seeds in a shallow layer at a temperature of 35 to 40 C.

6.2.h

h. **Predry.** — Place the seed in a shallow layer at a temperature of 35°C to 40°C for a period of five to seven days, with provision for circulation of the air.

21. When using the predry method how many days does the sample need to stay exposed to the high temperatures?

a. 3-5
b. 2-3
c. 4-5
d. 5-7

6.2.h

h. **Predry.** — Place the seed in a shallow layer at a temperature of 35°C to 40°C for a period of five to seven days, with provision for circulation of the air.

22. True False The number of prechill days is a recommended number of days and not a required number of days.

6.9.n.(1)

n. **Prechill and Paired tests.** —

(1) **Prechill procedures for all seed not categorized as tree or shrub** by AOSA Rules for Testing Seeds Volume 3. Uniform Classification of Weed and Crop Seeds (see section 4): Place seed on or in moist substratum at the indicated low temperature for the specified period of time. Refer to Table 6A.

23. Which of the following are approved temperatures for an oat germ?

a. 20-30 C
b. 25 C
c. 15 C
d. 20 C

Avena sativa oat and red oat	B, T, S	20; 15	5	10		Prechill at 5 or 10°C for 5 days and conclude test on 7th day or predry (refer to sec. 6.2h) and test for 10 days

24. If the predry method is used for breaking dormancy, how many days is the final count?

a. 10
b. 15
c. 17
d. 7

Avena sativa oat and red oat	B, T, S	20; 15	5	10		Prechill at 5 or 10°C for 5 days and conclude test on 7th day or predry (refer to sec. 6.2h) and test for 10 days

25. If the prechill method is used for breaking dormancy, how many days is the final count?

a. 7
b. 10
c. 5
d. 12

Avena sativa oat and red oat	B, T, S	20; 15	5	10		Prechill at 5 or 10°C for 5 days and conclude test on 7th day or predry (refer to sec. 6.2h) and test for 10 days

26. Which of the following are approved media options for oat germination? (Select all that apply)

a. Between blotters
b. Pleated paper
c. Towels
d. Creped cellulose
e. Sand

Avena sativa oat and red oat	B, T, S	20; 15	5	10		Prechill at 5 or 10°C for 5 days and conclude test on 7th day or predry (refer to sec. 6.2h) and test for 10 days

B: between blotters
C: creped cellulose paper wadding (0.3-inch thick Kimpak or equivalent) covered with a single thickness of blotter through which holes are punched for the seed that are pressed for about one-half their thickness into the paper wadding
O: organic growing media
OT: organic growing media covering seed planted on top of paper toweling (T)
P: covered petri dishes or other rigid transparent containers, with appropriate layers of blotters, filter paper, paper toweling, creped cellulose paper, pleated paper or sand that provide adequate moisture to the seeds during the test period
PP: pleated filter paper (see footnote a in Table 6A)
PT: substrata listed for P with the following substrata also allowed: sponge rok, vermiculite, terralite, or a mixture of 50 percent sand and vermiculite, sand and perlite, etc.
~~**RB:** blotters and raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds~~
S: sand
T: paper toweling, used either as folded towel tests or as rolled towel tests in horizontal or vertical position

27. True False The number of days of the prechill are to be included in the total number of days tested.

6.9.d.(1)

d. **Duration of test.** — The duration of test for each of the various kinds of seeds is given in Table 6A. The following deviations from the prescribed test are permitted:

(1) The prechilling period and the predrying period are not included in the germination periods given in Table 6A unless otherwise specified.

A sample of Jeffrey pine, *Pinus jeffreyi,* was received in the laboratory for testing. Answer the following questions pertaining to the sample.

28. What is the recommended minimum weight that should be submitted for this crop?
    a. 600 seeds
    b. 500 g
    c. 300 g
    d. 1000 g

1.4.a.(6)

(6) Tree and shrub seed samples (as categorized by AOSA Rules for Testing Seeds Vol. 3. Uniform Classification of Weed and Crop Seeds) shall consist of at least 600 seeds per sample for germination purposes (1,000 seeds for paired tests). If a purity analysis or a noxious weed seed examination is required, the submitted sample shall provide at least the minimum weights of working samples set forth in section 2.4.

Section 2.4 is Table 2A. There is no minimum weight for noxious weed seed or bulk examination but there is a footnote b under the purity heading. Refer to footnote b at the end of Table 2A.

Table 2A. Weights for working samples

Pure Seed Unit #	Chaffy (C) or Super Chaffy (SC)[a]	Kind of seed	Minimum weight for purity analysis[b]	Minimum weight for noxious weed seed or bulk examination	Approximate number of seeds per gram[c]	Approximate number of seeds per ounce[d]
			Grams	Grams	Number	Number
2		*Pinus elliottii* Engelm. slash pine	96		26	735
2		*Pinus flexilis* E. James limber pine	250		10	275
2		*Pinus glabra* Walter spruce pine	25		102	2,900
2		*Pinus halepensis* Mill. Aleppo pine	50		55	1,560
2		*Pinus heldreichii* Christ Bosnian pine	50		45	1,220
2		*Pinus jeffreyi* Balf. Jeffrey pine	300		7	200

Footnote b.

[b] If it is necessary to conduct a noxious weed seed examination, see section 2.3 to determine size of the working sample. For those kinds listed that show over 500 grams as the minimum weight for purity analysis, the actual amount given shall also be considered the minimum quantity to be examined for noxious weed seeds. In no other cases does the amount examined for noxious weed seeds need to exceed 500 grams for raw seed or 1,000 grams for coated, encrusted or pelleted seeds.

Footnote b tells you that you should examine a minimum of 500 grams or refers you to section 2.3. Section 2.3.b.(1) explains that you must test a minimum of 2,500 pure seed units for purity and 25,000 pure seed units for the noxious exam. According to table 2A there are 7 seeds per gram. 25,000 seeds / 7 seeds per gram = 3,571 grams. But footnote b states that you do not need to exceed 500 grams.

29. True False The same weight is used for both the Purity and Noxious exams on Jeffrey pine.

See long explanation in question 28. Same logic applies as 300 grams are needed for purity and 500 grams for noxious.

30. What is the minimum weight needed for a noxious exam? _____**500g**_____

See long explanation in question 28.

31. What Pure Seed Unit is used for Jeffrey pine?

a. 2
b. 4
c. 5
d. 3

		Bosnian pine				
2		*Pinus jeffreyi* Balf. Jeffrey pine	300		7	200

32. True False When present in a purity sample, wings must be removed and considered inert matter.

2	Seed with at least a portion of the seed coat attached. Broken seed larger than one-half the original size with at least a portion of the seed coat attached. Special considerations: * For Fabaceae: Cotyledons that are broken apart but held together by the seed coat shall be classified as pure seed. Cotyledons that have separated and are not held together by the seed coat are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the seed coat may be attached. * Wing, when present, is removed and considered inert matter. * Pericarp (fruit wall), when present on seeds of *Desmodium tortuosum*, *Hedysarum boreale*, and *Purshia tridentata* is removed and considered inert matter. * Weevil-infested vetch (*Vicia* spp.) and pea (*Pisum sativum*) seeds, irrespective of the amount of insect damage, are to be considered pure seed, unless they are broken pieces one-half the original size or less. * Chalcid-damaged seeds in Fabaceae that are puffy, soft, or dry and crumbly are considered inert matter.

33. Prescribed substrata for germination of Jeffrey pine are (select all that apply):

a. Top of blotter
b. Sand
c. Top of creped cellulose paper without a blotter
d. Pleated filter paper
e. Rigid transparent container with a mixture of 50 percent sand and vermiculite
f. Paper toweling

Pinus jeffreyi Jeffrey pine	TB, PT, S, TC	20-30		21	Paired tests. Prechill 28 days	Use embryo excision method; see sec. 6.9m(1)

PT: substrata listed for P with the following substrata also allowed: sponge rok, vermiculite, terralite, or a mixture of 50 percent sand and vermiculite, sand and perlite, etc.

~~**RB:** blotters and raised covers, prepared by folding up the edges of the blotter to form a good support for the upper fold which serves as a cover, preventing the top from making direct contact with the seeds~~

S: sand

T: paper toweling, used either as folded towel tests or as rolled towel tests in horizontal or vertical position

TB: top of blotters

TS: top of sand

TC: on top of creped cellulose paper without a blotter

34. What is the approved temperature for a germ test?

a. 30
b. 15-25
c. 20-30
d. 22

Pinus jeffreyi Jeffrey pine	TB, PT, S, TC	20-30		21	Paired tests. Prechill 28 days	Use embryo excision method; see sec. 6.9m(1)

35. If the prechill method is used for breaking dormancy, at how many days germination will the final count occur?

a. 21
b. 28
c. 14
d. 49

Reminder prechill days are not to be included in number of days tested.

Pinus jeffreyi Jeffrey pine	TB, PT, S, TC	20-30		21	Paired tests. Prechill 28 days	Use embryo excision method; see sec. 6.9m(1)

36. Which of the following methods is used to check the viability of ungerminated seeds after the prescribed germination period?

a. Germination promoting chemicals, such as GA_3
b. Cutting test
c. Tetrazolium test
d. Embryo excision test
e. Report hard seed percentage

Pinus jeffreyi Jeffrey pine	TB, PT, S, TC	20-30		21	Paired tests. Prechill 28 days	Use embryo excision method; see sec. 6.9m(1)

37. True False The percent viable seed from post germination testing is required to be listed on the Report of Analysis.

Section 6.2.f

f. **Dormant seed.** — Viable seeds, other than hard seeds, that fail to germinate when provided the specified germination conditions for the kind of seed in question. Viability of firm, ungerminated seeds of all species (see note below for clarification) must be determined by any appropriate method or combination of methods. Refer to section 6.9 m. The percentage of dormant seeds, if present, must be reported in addition to the percentage germination. If germination is over 90%, dormancy determination is not mandatory, unless it is a species sold on a pure live seed basis.

A sample of smooth brome, *Bromus inermis* subsp. *inermis,* was received in the laboratory for testing. Answer the following questions pertaining to the sample.

38. True False Centrifugal dividers are not suitable for use when dividing smooth brome.

Section 2.2.a.(1)

Bromus inermis subsp. *Inermis* is considered a chaffy grass. The centrifugal divider is not recommended for super chaffy grasses.

(1) **Centrifugal divider (Gamet type)**: This divider is suitable for all kinds of seed though it is not recommended for oilseeds (such as rapeseed, canola, mustards, flax) and kinds susceptible to damage (such as peas, soybeans, etc) and the extremely chaffy types.

39. How many decimal places should the working sample be weighed out to?

a. 0
b. 1
c. 2
d. 3
e. 4

For a complete test the requirement is 70 grams. So Section 2.3.a says 2 decimal places.

22	C	*Bromus inermis* Leyss. subsp. *inermis* smooth brome	7	70	300-330 (315)	8,475-9,385

Weight of working sample in grams	Number of decimal places
Less than 1.000	4
1.000 to 9.999	3
10.00 to 99.99	2
100.0 to 999.9	1
1000 or more	0

40. What is the minimum weight needed for a purity test? _____7g_____

22	C	*Bromus inermis* Leyss. subsp. *inermis* smooth brome	7	70	300-330 (315)	8,475-9,385

41. What is the minimum weight needed for a noxious exam? _____70g_____

22	C	*Bromus inermis* Leyss. subsp. *inermis* smooth brome	7	70	300-330 (315)	8,475-9,385

42. What Pure Seed Unit is used for smooth brome?

a. 24
b. 22
c. 21
d. 23
e.

22	C	*Bromus inermis* Leyss. subsp. *inermis* smooth brome	7	70	300-330 (315)	8,475-9,385

43. True False The amount of inert matter attached to the multiple units shall be determined by the method described in section 3.7 of the AOSA Rules.

Section 3.7 is the section that has the instructions for determining multiple seed units

3.7 Multiple unit procedures

a. **Use of the multiple unit procedures:** The following methods shall be used only for the species included in Table 3B when multiple units are present in a sample. These methods are applicable to the kinds listed when they are the single kind of seed under consideration or they occur in mixtures of kinds.

44. A multiple unit is a seed unit that includes one or more structures as follows (select all that apply):

a. A fertile floret with basally attached glume, glumes, or basally attached sterile floret of any length.
b. A fertile floret with two or more attached sterile and/or fertile florets of any length.
c. Any seed unit without attached structures.
d. An attached sterile or fertile floret that extends to or beyond the tip of a fertile floret.

Section 3.7.b

b. **Definition:** A multiple unit is a seed unit that includes one or more structures as follows:

(1) An attached sterile or fertile floret that extends to or beyond the tip of a fertile floret (structures 8-12);

(2) A fertile floret with basally attached glume, glumes, or basally attached sterile floret of any length (structures 13-14);

(3) A fertile floret with two or more attached sterile and/or fertile florets of any length (structures 5-7).

45. True False If no multiple unit factor is available in Table 3B, all multiple units are considered pure seed.

Section 3.7.d.(1)

d. **Exceptions to the multiple unit procedures:**

(1) In cases where no factor is available (i.e. dash in column for related percentage of single units), seed units shall consist of single florets and caryopses. All attached multiple units shall be manually separated into single florets, all sterile material (sterile florets, glumes) shall be removed and classified as inert matter. Attached fertile florets shall be separated into single florets. For further information refer to AOSA News Letter 60(1):10.

46. The working weight of this sample is 7.868g, you determine there is 6.324g single units and 1.224g multiple units. What factor will be used to find the weight of pure seed from multiple units?

a. 0.83
b. 0.85
c. 0.72
d. 0.82

Determine the percentage of single units

6.324g single units 1.224g multiple units

6.324 + 1.224 = 7.548 grams

$$\frac{6.324}{7.548} = 0.8378 \times 100 = 83.78\%$$

Use Table 3B to find the multiple factor based off the % of single units determined above.

Table 3B. Factors to apply to multiple units[a]

Percent of single units of each species	Crested wheatgrass[b]	Pubescent wheatgrass	Intermediate wheatgrass	Tall wheatgrass[c]	Western wheatgrass[c]	Smooth brome
			%			
50 or below	0.70	0.66	0.72	—	—	0.72
50.01-55.00	0.72	0.67	0.74	—	—	0.74
55.01-60.00	0.73	0.67	0.75	—	—	0.75
60.01-65.00	0.74	0.67	0.76	—	—	0.76
65.01-70.00	0.75	0.68	0.77	—	0.60	0.78
70.01-75.00	0.76	0.68	0.78	—	0.66	0.79
75.01-80.00	0.77	0.69	0.79	0.50	0.67	0.81
80.01-85.00	0.78	0.69	0.80	0.55	0.68	0.82
85.01-90.00	0.79	0.69	0.81	0.65	0.70	0.83
90.01-100.00	0.79	0.70	0.82	0.70	0.74	0.85

47. Using the following component weights, what will be the reported Pure Seed percent?

Single Units	6.324 g
Multiple Units	1.224 g
Other Crop	0.171 g
Inert Matter	0.144 g
Weed Seed	0.005 g

a. 93.14%
b. 83.78%
c. 90.06%
d. 95.82%

1.224 grams multiple units 0.82 multiple unit factor

1.224 x 0.82 = 1.004 grams of multiples are pure seed units

1.224-1.004 = 0.22 grams of multiples are inert

6.324 pure seed + 1.004 grams multiple pure seed units = 7.328 grams

$$\frac{\text{7.328 pure seed grams}}{\text{7.868 grams total}} = .9314 \times 100 = 93.14\%$$

48. How many days after the first count is the final count?

a. 7
b. 21
c. 14
d. 8

14 day final count – 6 day first count = 8 days

Bromus inermis subsp. *inermis* smooth brome	P, B, TB	20-30	6	14	Light optional	Prechill at 5 or 10°C for 5 days, then test at 30°C for 9 additional days

49. How are dormant samples of smooth brome handled?

a. Prechill at 5 or 10°C 7 days
b. KNO_3
c. Prechill at 5 or 10°C for 5 days, then test at 30°C for 9 additional days
d. Test in soil at 15°C
e.

Bromus inermis subsp. *inermis* smooth brome	P, B, TB	20-30	6	14	Light optional	Prechill at 5 or 10°C for 5 days, then test at 30°C for 9 additional days

A sample of centipedegrass, *Eremochloa ophiuroides,* was received in the laboratory for testing. Answer the following questions pertaining to the sample.

50. After the appropriate number of primary samples are taken, they should be combined to create the **submitted/composite** sample to submit to the laboratory.

Section 1.5.a

1.5 Forwarding of seed samples to laboratory

a. After the appropriate number of primary samples for the size of the seed lot are drawn and combined into the composite sample, the entire composite sample is submitted to the laboratory. If the composite sample is too large, or if the composite sample is to be split into duplicate samples for submission to the same or different laboratories, the composite sample must be thoroughly blended and then split by an appropriate mechanical or non-mechanical method (refer to section 2.2).

51. True False It is required that the submitted sample be retained by the laboratory for a minimum of one year.

Section 1.8

1.8 Storage recommendations of seed samples after testing

Submitted samples on which a Report of Analysis has been issued should be kept by the laboratory for at least one year after testing is completed as part of the record of the seed sample to support the original findings. When a purity analysis, noxious weed seed examination, or bulk examination is conducted, all contaminants found should be retained as part of the record for that sample. In the case of expensive seed at least 25 seeds to verify identity should be retained and the remainder may be returned to the customer upon request. It is strongly suggested that the storage facility be such that environmental conditions are not detrimental to the seed being stored and should be insect and rodent free.

52. What is the approximate number of seeds per gram? **1253**

15		*Eremochloa ophiuroides* (Munro) Hack. centipedegrass	2	20	1,253	35,530

53. Which of the following would be considered inert matter?
   a. Caryopsis with no endosperm development present
   b. Caryopsis two thirds the size of the original seed
   c. Spikelet with awn attached
   d. Spikelet without attached rachis segment

15	Spikelet with or without attached rachis segment (also see rame internode in glossary), pedicel and sterile spikelet, with or without awn(s), provided a caryopsis with some degree of endosperm development can be detected (either by slight pressure or by examination over light). Caryopsis or piece of broken caryopsis larger than one-half of the original size.

54. A relative humidity of_____ % should be maintained in the germination chamber to ensure adequate moisture level.

a. 100%
b. 95%
c. 90%
d. 75%

Section 6.3

The addition of water subsequent to placing the seeds in test will depend on the evaporation from the substrata in the germination chambers. Since the rate of evaporation will depend upon the relative humidity of the air, it is desirable to keep water in the germination chambers or to provide other means of supplying a relative humidity of approximately 95 percent. Germination tests should be inspected at frequent intervals to insure that an adequate moisture supply is available at all times.

55. True False Centipedegrass requires light for germination.

Eremochloa ophiuroides centipedegrass	P	20-35	7	21	Light	See sec. 6.8n

56. What is the temperature for a germination test?

a. 15
b. 20-30
c. 25
d. 20-35

Eremochloa ophiuroides centipedegrass	P	20-35	7	21	Light	See sec. 6.8n

57. Variation from the required temperature should not exceed how many degrees?

a. +/- 5
b. +/- 1
c. +/- 3
d. +/- 2

6.9.c

c. **Temperature.** — Single numerals in Table 6A indicate constant temperatures. Two numerals separated by a dash indicate an alternation of temperature, the test to be held at the first temperature for approximately 16 hours and at the second temperature for approximately eight hours per day. A sharp alternation of temperature, such as obtained by hand-transfer, may be beneficial in breaking dormancy. If the tests are not subjected to alternating temperatures over weekends and holidays, they are to be held at the lower temperature during this time. Variation from the temperature specified in the Rules should not be more than ±1 °C due to the apparatus. In the case of species of *Trifolium*, *Medicago* and *Vicia faba*, the temperature should not exceed 20 °C.

58. If there are firm seeds remaining at the final count what is the appropriate procedure?

a. Report the firm seeds as dormant
b. Clip the distal end and extend for 7 days
c. Report the firm seeds as hard
d. Clip the distal end and extend for 5 days

6.8.n

n. **Centipedegrass** (*Eremochloa ophiuroides*). — Firm seed remaining at 21 days shall be clipped distal from the embryo and transferred to substratum moistened with gibberellic acid (GA_3; 400 ppm), for seven additional days. Refer to section 6.9 m (4) for GA_3 procedure. Normal seedlings developing from this special procedure are to be reported as percent dormant seed.

59. What germination promoting chemical should be used when extending germ test?

a. Ethephon
b. Potassium nitrate
c. Calcium nitrate
d. Gibberellic acid

6.8.n

n. **Centipedegrass** (*Eremochloa ophiuroides*). — Firm seed remaining at 21 days shall be clipped distal from the embryo and transferred to substratum moistened with gibberellic acid (GA_3; 400 ppm), for seven additional days. Refer to section 6.9 m (4) for GA_3 procedure. Normal seedlings developing from this special procedure are to be reported as percent dormant seed.

A sample of side-oats grama, *Bouteloua curtipendula,* was received in the laboratory for testing. Answer the following questions pertaining to the sample.

60. The sub-sample taken either from the pure seed portion of the purity analysis or directly from the submitted sample on which the germination test is performed is referred to as:

a. Noxious working sample
b. Germination working sample
c. Purity working sample
d. Seed moisture working sample

Section 2.1.c.(3)

(3) **Germination working sample:** the sub-sample taken either from the pure seed portion of the purity analysis or directly from the submitted sample on which the germination test is performed. Refer to sections 2.3 c and 6.1.

61. The pure seed unit for multiple seed units is?

a. 21
b. 23
c. 19
d. 25

21 23	SC	*Bouteloua curtipendula* (Michx.) Torr. side-oats grama (single florets and/or caryopses) (other than single florets and/or caryopses)	2 6	20 60	1,250 350	35,437 9,950

62. The pure seed unit for a sample of caryopsis is?

a. 19
b. 21
c. 23
d. 25

21 23	SC	*Bouteloua curtipendula* (Michx.) Torr. side-oats grama (single florets and/or caryopses) (other than single florets and/or caryopses)	2 6	20 60	1,250 350	35,437 9,950

63. True False Side-oats grama has a uniform blowing procedure

Section 3.6.b

b. **Purpose:** The uniform blowing procedure shall be used for separation of pure seed and inert matter in the following: Kentucky bluegrass (*Poa pratensis*), Canada bluegrass (*P. compressa*), rough bluegrass (*P. trivialis*), weeping alkaligrass (*Puccinellia distans*), 'Pensacola' variety of bahiagrass *(Paspalum notatum),* orchardgrass (*Dactylis glomerata*), blue grama (*Bouteloua gracilis*), and side-oats grama (*B. curtipendula*).

64. Prior to using the uniform blower the sample needs to be divided into how many equal parts?

a. 5
b. 2
c. 3
d. 4

Section 3.6.b.(7)

(7) **Side-oats grama:** The equivalent air velocity value (m/s) for side-oats grama shall be used. To determine this value, first determine the optimum calibration point for Kentucky bluegrass using a standard calibration sample. The blower gate opening value for the optimum calibration point shall be multiplied by a factor of 1.480 to obtain the adjusted gate opening value for side-oats grama. The factor of 1.480 is restricted to the General-type seed blower, see sections 3.3 and 7.2 in AOSA Rules for Testing Seeds Volume 2. The blower gate shall be opened to the adjusted value and the equivalent air velocity value (m/s) shall be determined for side-oats grama. Before blowing, remove any extraneous material that will interfere with the blowing process. The sample to be blown shall be divided into four (4) approximately equal parts and each part blown separately. Throughout the blowing procedure, watch the seeds in the seed cup of the blower, and carefully agitate the seed cup as the seeds begin to bunch up.

65. Caryopsis at least one third the length of the floret found in the light portion shall be classified as:

a. Pure seed
b. Weed seed
c. Other crop seed
d. Inert matter

Section 3.6.b.(7)

STEP 1. Separating the light fraction: The light fractions from the four blowings are combined, and the other crop seed, weed seed, and inert matter are separated according to sections 3.2 - 3.8. Additionally, check the combined light portions for florets containing caryopses at least 1/3 the length of the floret. All such seed units shall be added to the pure seed. The large extraneous matter, which was removed before the blowings, is added to the inert matter component of the sample. All remaining florets of side-oats grama blown into the light fraction are considered inert matter.

66. True False The seed units remaining in the heavy portion need to be checked to determine if there is at least one caryopsis one third the length of the floret.

Section 3.6.b.(7)

STEP 2. Separating the heavy fraction: The heavy fractions from the four blowings are combined, and other crop seeds, weed seeds, seed-like particles and inert matter (sticks, sand, etc.) are classified in accordance with sections 3.2 - 3.8. All side-oats grama seed units remaining in the heavy fraction are to be considered pure seed. However, caryopses that are broken and one-half or less the original size are considered inert matter. Seed units with fungus bodies, such as ergot are classified in accordance with section 3.5 a.

67. Which of the following are special treatments for the germination test? (Select all that apply)?

a. Dark
b. Light
c. Kno_3
d. GA_3

Bouteloua curtipendula side-oats grama	P	15-30	7	14	Light; KNO_3	Ungerminated seeds: see sec. 6.2f and 6.9m

68. Which temperature is acceptable for the germination test?

a. 15
b. 15-30
c. 15-25
d. 20-30

Bouteloua curtipendula side-oats grama	P	15-30	7	14	Light; KNO_3	Ungerminated seeds: see sec. 6.2f and 6.9m

69. True False When the multiple floret is planted each seedling is to be counted as a normal seedling.

Section 6.5.c

c. **Multiple seed units.** — Spinach, New Zealand spinach, *Beta* spp., schizocarps (double fruits) of Apiaceae, adhering pairs of *Allium* seeds, multiple seeds of little burnet, seed units of grasses consisting of multiple florets, and tree and shrub seed with multiple seed units shall be regarded as having germinated if they produce one or more normal seedlings. A total seedling count by replicating a 400 seed test may be conducted on tree and shrub seed with multiple seed units to determine the total number of seedlings. For the total seedling count, the seed units shall remain on the substrate until the end of the germination test, and all seedlings shall be counted. The result from the germination test shall be reported as percentage germination, and the result of the total seedling count shall be reported as the number of seedlings per 100 seed units.

70. True False An analyst can terminate a test prior to the final count days if they are positive that maximum germination has been achieved.

6.9.d.(3)

(3) Any test may be terminated prior to the number of days listed under "Final Count" if the analyst is positive the maximum germination of the sample has been attained.

71. True False All ungerminated seeds at the end of the testing period shall be reported as dead seeds.

6.9.m

m. **Viability testing of ungerminated seed.** — Any of the following methods or combination of methods, unless otherwise specified, may be used to determine the viability of ungerminated seed that remain at the end of the prescribed test period. The results are to be reported as percentage dormant or hard seed as determined by the specified method.