Quality Certification Services Inc.

Meter Technician Certification Exam

Revised September 2012
Version 12.0

This exam is designed to test the knowledge of meter technicians in order to attain certification to check the calibration of portable meters. It is necessary that they demonstrate an understanding of the operation, maintenance, repair, and calibration procedures for varying types of portable milk meters used in the marketplace. This exam can also be used as a review by meter technicians in preparation for the Quality Certification Services Inc. recertification audit.

Meter technician name: _____

Meter technician address: _____

_____

Meter technician phone number: _____

Meter technician email address: _____

Meter center used: _____

Meter technician trainer: _____

Exam date: _____

Exam grade: _____

METER RIG QUESTIONS

1. **When making changes to the meter center or meter technicians performing calibration and repair services, how soon should the auditor be notified?**

    a. **At the next regularly scheduled meter center audit**
    b. **At the next regularly scheduled field service audit**
    c. **Within 30 days**
    d. **Within 6 months**

2. **There are seven changes to a meter center that will require a 'discretionary' audit. They are?**

    a.
    b.
    c.
    d.
    e.
    f.
    g.

3. **The correct vacuum level for using either the standard or fast-flow water test methods is:**

    a. **14" Hg with a range of 13.5 – 14.5" Hg**
    b. **15" Hg with a range of 14.5 – 15.5" Hg**
    c. **16" Hg with a range of 15.5– 16.5" Hg**

4. **The devices approved for determining the initial water volume for the water testing methods include:**
    a. **Accurate scales only**
    b. **DHI approved weigh jars only**
    c. **Volumetric flasks only**
    d. **Accurate scales or volumetric flasks only**
    e. **Accurate scales, DHI approved weigh jars, or volumetric flasks**

5. **The initial water volume required for water testing a meter is:**
    a. **16.0 liters, 16 kilograms, or 35.3 lbs**
    b. **17.0 liters, 17 kilograms, or 37.4 lbs**
    c. **Variable as long as the meter reads within 3%**
    d. **15.5 liters or 15.5 kilograms**

6. **The maximum tolerance for vertical alignment (tilt) of the milk meter is:**
    a. **+/-3%**
    b. **+/-5%**
    c. **+/-7%**

d. +/-6%

7. The maximum tolerance for horizontal alignment of the Waikato milk meter is:
   a. +/-3%
   b. +/-5%
   c. +/-7%
   d. +/-6%

8. What type of reading would you expect if the meter is leaning too far forward?
   a. Heavy
   b. Light
   c. Won't affect the meter at all

GENERAL METER QUESTIONS

9. Gaskets and o-rings must provide proper sealing of the meter. Why?

10. Flask printing is guaranteed to remain legible under recommended washing, care, and use procedures.
    a. True
    b. False

11. The mixture of milk and air during the milking process are critical to the operation of volumetric meters.
    a. True
    b. False

12. An air leak in a volumetric meter will cause the meter to read:
    a. Heavy
    b. Light

13. Excess exposure to _____ causes premature yellowing of the polysulfone plastics.

14. To ensure proper cleaning, more water and cleaning solutions may need to be added during the CIP wash-up when meters are in the barn. Why?

15. **Rubber components do not absorb milk fat and therefore do not need to be checked as part of the routine maintenance of the meter.**
    a. **True**
    b. **False**

16. **Meter manufacturers recommend checking meters and replacing rubber gaskets, o-rings, and hoses at least once a year with model specific service kits.**
    a. **True**
    b. **False**

17. **Taking the meters apart and scrubbing every part with a stiff brush is a great way to clean them and maintain their calibration accuracy.**
    a. **True**
    b. **False**

18. **If an unusual or disproportionate amount of meters are failing calibration, where should you focus your attention in order to solve the problem?**
    a. **Meter**
    b. **Flask Calibration Markings**
    c. **Meter Calibration Rig**
    d. **Field Technician**

19. **Since all meters operate with the same basic principle, a certified meter technician is authorized to check the calibration of any and all meters:**
    a. **True**
    b. **False**

20. **What is the ONLY type of lubricant that can be used on the Tru-Test meter's O-rings and valve assemblies?**
    a. **White grease**
    b. **WD40**
    c. **Food Grade Silicon**
    d. **Bearing grease**
    e. **3-in-1 Oil**

21. **Which 3 chemicals or compounds will damage the polysulfone meter plastics?**
    a. **Silicon**
    b. **Hydrocarbon based compounds**
    c. **Petro-chemicals**
    d. **Alcohol**
    e. **Soap**

22. You calibrate a meter and get the following results: 1ST run 34.5, 2ND run 35.0, 3RD run 37.5, and 4TH run 37.5. What calibration(s) do you need to record for the calibration record to meet the CDCB guidelines?

- **a. 1ST ONLY**
- **b. 3RD AND 4TH**
- **c. 4TH ONLY**
- **d. 1ST AND 4TH**
- **e. ALL**

23. At the completion of a successful calibration, the meter must be marked with the following information:

- **a. Meter center name only**
- **b. Meter technician name only**
- **c. Meter technician name and year checked**
- **d. Meter center name and year checked**

24. According to the CDCB guidelines, calibration check intervals for portable meters must not exceed:

- **a. 300 days**
- **b. 365 days**
- **c. 400 days**
- **d. 425 days**

25. A Foss, Tru-Test, or Waikato meter is checked for calibration using the Standard Water Test Method and the reading is 35.5 lbs on the first run. Has this meter passed the CDCB tolerance requirements?

- **a. Yes**
- **b. No**

26. A Foss, Tru-Test, or Waikato meter is checked for calibration using the Standard Water Test Method and the flask reading is 37.5 lbs for the first run. Has this meter passed the CDCB tolerance requirements?

- **a. Yes**
- **b. No**

27. A Foss, Tru-Test, or Waikato meter is checked for calibration using the Standard Water Test Method. The readings are 35.5 lbs for the first run and 36.0 lbs for the second. Has this meter passed the CDCB tolerance requirements?

- **a. Yes**
- **b. No**

28. According to the CDCB guidelines, new meters with manufacture dates over 365 days ago must be checked for calibration before being placed in service for the first time:

- **a. True**
- **b. False**

29. **When documenting the calibration check results from a water test, the flask reading should be taken:**
    a. **At the bottom of the water meniscus**
    b. **At the top of the water meniscus**
    c. **In the middle of the meniscus**

STANDARD FLOW TEST SPECIFIC

30. **In what two ways can you verify the correct size of the air admission orifice required by the Standard Water Test Method?**
    a. **18 gauge needle**
    b. **16 gauge needle**
    c. **Paper clip**
    d. **Thin wire**
    e. **#60 drill bit**

31. **The water flow restrictor required by the Standard Water Test Method must produce a flow rate of about:**
    a. **8.0 lbs / minute**
    b. **10.0 lbs/minute**
    c. **18.2 lbs/minute**
    d. **36.4 lbs/minute**

32. **The target time for checking the calibration of meters using the Standard Water Test Method is:**
    a. **55-60 seconds**
    b. **1 minute, 8 seconds**
    c. **4 minutes, 34 seconds**
    d. **3 minutes, 30 seconds**

33. **The air admission orifice required by the Standard Water Test Method must be located:**
    a. **12 – 24" from the meter inlet**
    b. **24 – 36" from the meter inlet**
    c. **More than 36" from the meter inlet**
    d. **Wherever you can find a spot**

FAST-FLOW TEST SPECIFIC

34. **Air bubbles in the fast-flow calibration lines will not cause a calibration error in the Tru-Test meters.**
    a. **True**
    b. **False**

35. **When using the Fast-Flow Water Test Method, the distance from the restrictor inlet to the top of the flask is:**
    a. **60”**
    b. **63”**
    c. **64.5” +/- 1/2”**
    d. **Irrelevant as long as the inlet pipe is straight**

36. **The target time for checking the calibration of STANDARD BORE Tru-Test meters using the Fast-Flow Water Test Method is:**
    a. **55-65 seconds**
    b. **1 minute, 8 seconds**
    c. **4 minutes, 34 seconds**

37. **The target time for checking the calibration of WIDE BORE Tru-Test meters using the Fast-Flow Water Test Method is:**
    a. **55-65 seconds**
    b. **1 minute, 8 seconds**
    c. **4 minutes, 34 seconds**

TRU-TEST METER SPECIFIC QUESTIONS

38. **The nozzle is very sensitive to damage or blockage and may cause a meter to not calibrate correctly.**
    a. **True**
    b. **False**

39. **Calibrated flasks from different Tru-Test meter models are identical and are interchangeable between models.**
    a. **True**
    b. **False**

40. **Name 3 parts of the meter, that if cracked or damaged, could cause abnormal meter readings.**

    1.

    2.

    3.

41. **The valves on the milk meters should be left in the “Milking” position between milkings.**
    a. **True**
    b. **False**

42. **Meter parts are 100% interchangeable and therefore do not require a calibration check following replacement of caps or nozzles.**
    a. **True**
    b. **False**

43. **All Tru-Test Meter parts are interchangeable and checked at the factory, and therefore do not require a calibration check following replacement of a cap, flask body or nozzle.**
    a. **True**
    b. **False**

44. **The methods of water testing that are approved for use with the Tru-Test meter are:**
    a. **Standard and Dual-Meter Water Test Methods only**
    b. **Standard, Dual-Meter, and Fast-Flow Water Test Methods**
    c. **Standard, Dual-Meter, Fast-Flow, and Volume Test Methods**
    d. **Standard, Dual-Meter, Fast-Flow, Volume, and Weight Test Methods**

45. **Which of the following measuring principles best describes the Tru-Test meter operation:**
    a. **Weight**
    b. **Volumetric**

46. **The Mini-Test and Mini-Manager meters have recently been approved for use in herds submitting records to AIPL:**
    a. **True**
    b. **False**

47. **Meter Caps, sleeve funnels, or nozzles that have become slightly worn, chipped or cracked will not affect the calibration of a meter.**
    a. **True**
    b. **False**

48. **Tru-Test meters are checked for calibration at the factory:**
    a. **True**
    b. **False**

TRU-TEST AUTO SAMPLERS ONLY

49. **In order to verify that an air leak is coming from the flask or caused by the auto-sampler, simply pinch the tubing and check for bubbles to help isolate the cause.**
    a. **True**
    b. **False**

50. **The auto-sampler should be checked during calibration to ensure adequate sample amounts.**
    a. **True**
    b. **False**

WAIKATO METER SPECIFIC QUESTIONS

51. Name 3 parts of the meter, that if cracked or damaged, could cause abnormal meter readings.

1.

2.

3.

52. The methods of water testing that are approved for use with the Waikato MK 5 meter are:

a. Standard and Dual-Meter Water Test Methods only
b. Standard, Dual-Meter, and Fast-Flow Water Test Methods
c. Standard, Dual-Meter, Fast-Flow, and Volume Test Methods
d. Standard, Dual-Meter, Fast-Flow, Volume, and Weight Test Methods

53. Waikato MK 5 meters are checked for calibration at the factory:

a. True
b. False

54. Which of the following measuring principles best describes the Waikato MK 5 meter operation:

a. Weight
b. Volumetric

55. According to the CDCB guidelines, new Waikato MK 5 meters must be checked for calibration before being placed in service for the first time:

a. True
b. False

56. Air bubbling in the meter flask may be caused by worn 3-way taps:

a. True
b. False

57. What must be done when converting from a 65 lb flask to a 92 lb flask?

a. Remove the steel ball
b. Snip off the lug on the ball cage assembly
c. Replace the cover

58. Flask bungs for the Waikato MK 5 meter are interchangeable between the 65 lb and 92 lb models:

a. True
b. False

59. **With only three parts to interchange, a simple process of elimination is used to recalibrate the milk meter. What three parts does the manufacturer suggest you should change?**

    1.

    2.

    3.

60. **With the exception of the flask, bungs, and ball cage housing, parts are interchangeable between the 65 lb and 92 lb models:**
    a. **True**
    b. **False**

61. **The three parts that may affect calibration of the meter and must be replaced by a certified meter technician are the flask, cover, and base assembly:**
    a. **True**
    b. **False**

62. **Snipping off the end of the 3-way tap is an acceptable way to improve sampling speed.**
    a. **True**
    b. **False**

63. **While calibrating meters, you see air bubbling coming from the bottom of the flask. What is the cause, and how do you correct it?**
    a. **3-way tap is worn, dry, or not properly seated**
    b. **replace, wet, or properly seat 3 way tap**

64. **When converting the MK V to a SPEEDSAMPLER meter it is not necessary to recalibrate the meter after all the components are changed.**
    a. **True**
    b. **False**

65. **Is it possible to use the wash cap to replace a sample vial during the calibration?**
    a. **True**
    b. **False**

66. **What are the three main parts when making a repair that would make it necessary to recalibrate a SPEEDSAMPLE or MKV?**
    a. **Cover**
    b. **SpeedSampler**

c. **Base assembly**
d. **Flask**
e. **Bung**

67. **The allowed limits to calibrate a SPEEDSAMPLER of MK V with only one run are:**
    a. **35.0 to 38.0**
    b. **35.5 to 37.5**
    c. **36.0 to 37.0**

68. **Factory specifications require you to install service kits how often? Please choose two**
    a. **Every other year**
    b. **Every year**
    c. **Once every three years**
    d. **As needed**

69. **When converting a MK V to a SPEEDSAMPLER you can use the same lower valve housing.**
    a. **True**
    b. **False**