

Sample Questions

National Registry of Certified Microbiologists
SM: Pharmaceutical and Medical Device

The National Registry of Certified Microbiologists
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SAMPLE QUESTIONS

The sample questions included in this examination guide are actual questions from previous examinations. They have been removed from the question pool. Do not judge the content as indicative of content in current questions, but use these sample questions as templates for the format and design of questions and answers.

1. The most reliable way to monitor the adequacy of the sterilization cycle of an autoclave is to:
 - a. use endospore strips.
 - b. use tape indicators.
 - c. allow 15 minutes at 15 pounds of pressure.
 - d. allow 15 minutes at 121°C.
 - e. use methylene blue strips.**Corresponds to task #1.**

2. If you were preparing a sterile, heat-labile pharmaceutical solution, which one of the following pore sizes would you select for membrane filtration of the solution?
 - a. 0.1 µm
 - b. 0.2 µm
 - c. 0.5 µm
 - d. 1.0 µm**Corresponds to task #2.**

3. In-line filter integrity tests should be performed:
 - a. at the beginning of the filtration process.
 - b. at the middle and end of the filtration process.
 - c. at the middle of the filtration process.
 - d. at the beginning and end of the filtration process.
 - e. when the bulk bioburden exceeds established limits.**Corresponds to task #2.**

4. Which device would give the most rapid and consistent temperature equilibration within a culture?
 - a. Gravity incubator
 - b. Anaerobic incubator
 - c. Convection incubator
 - d. Circulating water bath
 - e. Low-temperature incubator**Corresponds to task #3.**

5. A pH meter should have a compensation adjustment control for:
 - a. light.
 - b. color.
 - c. magnetism.
 - d. altitude.
 - e. temperature.**Corresponds to task #4.**

6. Your pH meter seems to drift excessively after calibration. What is the most likely cause?
 - a. Improper temperature
 - b. Voltage surges
 - c. Slope drift
 - d. A faulty LED
 - e. Contaminated electrodes**Corresponds to task #4.**

7. High-efficiency particulate air (HEPA) filters in laminar flow cabinets must remove what percentage of 0.3-µm particles to be acceptable?
 - a. 90.00
 - b. 95.00
 - c. 99.95
 - d. 99.97**Corresponds to task #5.**

8. The purpose of bile salts, citrate, brilliant green, and desoxycholate is to:
- make the media differential.
 - enhance the growth of enteric pathogens.
 - make the media selective.
 - buffer the pH of the media.
- Corresponds to task #10.**
9. Microorganisms which produce a clear zone around colonies on a skim milk agar plate after the plate is flooded with hydrochloric acid may be classified as:
- lipolytic.
 - peptolytic.
 - proteolytic.
 - saccharolytic.
- Corresponds to task #10.**
10. The poured plates of Baird Parker staphylococcus agar have clear lumps in them. What is the most likely explanation for the clear lumps?
- The egg yolk tellurite supplement was added when the agar was too hot.
 - The egg yolk tellurite was added after the agar base was too cool.
 - The agar base was not melted before autoclaving
 - The pH of the agar base was out of specification.
- Corresponds to task #10.**
11. An accurate written record that can be used to trace the possession of a sample from the moment of its collection to the completion of the analysis is known as the:
- field data sheet.
 - final report.
 - chain of custody.
 - request for analysis.
- Corresponds to task #14.**

12. Coliforms are:
- strict anaerobes.
 - hydrogen sulfide producers.
 - lactose fermenters.
 - gram positive.
 - sucrose nonfermenters.
- Corresponds to task #19.**
13. A potable water sample for routine microbiological analysis arrives in your lab 48 hours after collection. You should:
- reject the sample and ask for another sample.
 - analyze the sample.
 - analyze the sample but report the results as suspect.
 - analyze the sample but adjust the results based on the time factor.
- Corresponds to task #22.**
14. Water samples for microbiological evaluation that are to be shipped via overnight carrier must be packed:
- with a cold pack to keep temperatures low.
 - in styrofoam or padding to prevent breakage.
 - in plastic to avoid breakage.
 - in insulated coolers to maintain temperature equilibrium.
- Corresponds to task #22.**
15. The microbial density of a suspension of a pure culture can be determined by spectrophotometry with preparation of a:
- standard curve using pour plates.
 - MacFarland standard.
 - most-probable-number test.
 - dry-weight comparison.
 - protein/cytoplasm optical density regression.
- Corresponds to task #23.**

16. Certain metabolites such as pyruvic, lactic, and fumaric acids are methylated prior to gas chromatography in order to:

- a. decrease retention time.
- b. decrease volatility.
- c. increase molecular weight.
- d. decrease molecular weight.
- e. increase retention time.

Corresponds to task #26.

17. Which reagent could be used for the dissociation of monolayers in tissue subculturing?

- a. DNase
- b. DMSO
- c. EDTA
- d. Tween 80

Corresponds to task #27.

18. Bacterial cultures can best be recovered from storage in liquid nitrogen if:

- a. the cell suspension is prepared from an early-stationary-phase culture.
- b. thawed at 37°C in a water bath.
- c. they were originally suspended in a mixture of skim milk and sucrose.
- d. they were frozen rapidly in a dry ice/ethyl Cellusolve bath.

Corresponds to task #42.

19. The main purpose of a laboratory coat is to:

- a. keep your clothes from being ruined.
- b. help assess the cleanliness of the laboratory.
- c. identify you as a trained professional.
- d. keep contamination off your clothing.
- e. give you access to several pockets at once.

Corresponds to task #43.

20. If a spill should occur within a biological safety cabinet (BSC), what steps would immediately be taken?

- a. Turn off the BSC and immediately wipe up the spill with a dry, absorbent towel.
- b. Turn off the BSC and wipe up the spill with a germicidal agent.
- c. Turn off the BSC, evacuate the laboratory, and notify company safety authorities.
- d. Leave the BSC on and wipe up the spill with a germicidal agent.
- e. Leave the BSC on and wipe up the spill with a dry, absorbent towel.

Corresponds to task #43.

21. RODAC plates are used for:

- a. air sampling.
- b. surface sampling.
- c. isolation of microbial colonies.
- d. water sampling.
- e. the phenol coefficient test.

Corresponds to task #48.

22. The *D* value stands for:

- a. disinfectant efficacy rating.
- b. time for a 90% population reduction.
- c. diffusion rate through a 0.22- μ m membrane filter.
- d. temperature change required to destroy 10^{12} spores.
- e. differential pressure.

Corresponds to task #50.

23. Which of the following describes the family *Enterobacteriaceae*?

- a. Oxidase-positive fermenters
- b. Gram-positive, asporogenous, rod-shaped bacteria
- c. Ferment glucose with formation of acid with or without gas
- d. Gram-negative nonfermenters
- e. Motile with polar flagella

Corresponds to task #31.

24. Glassware can be rendered pyrogen free by:

- a. washing with a membrane-filtered 70% alcohol solution.
- b. heating to 200°C for not less than 1 hour.
- c. heating to 250°C for not less than 30 minutes.
- d. heating to 100°C for not less than 15 minutes.

Corresponds to task #34.

25. Bentonite, blood cells, and latex beads are components used to:

- a. enhance phagocytosis.
- b. select xenotrophic organisms.
- c. perform agglutination tests.
- d. prepare selective media.
- e. prepare live vaccines.

Corresponds to task #37.

26. Membrane filtration is based on the exclusion of bacteria at the surface of the membrane and:

- a. requires a pressure drop across the membrane.
- b. relies on membrane depth and tortuosity of the pores.
- c. the filter is constructed of materials which cannot be sterilized.
- d. requires a mean pore diameter greater than 0.5 μm.
- e. is generally used with a filter aid such as diatomaceous earth.

Corresponds to task #54.

27. The deionized water system in your laboratory indicated low resistivity. The MOST likely cause is:

- a. a fouled ultrafiltration cartridge.
- b. an incorrect bypass valve pressure.
- c. a high particulate level in the feedwater.
- d. the ion-exchange cartridges are exhausted.
- e. the activated carbon cartridge requires a recharge.

Corresponds to task #59.

28. According to current Good Manufacturing Practices, deviations from established hold time limits may be acceptable, provided that:

- a. the bulk of the bioburden does not exceed established limits.
- b. the bioburden of the bulk solution does not exceed 10⁷ CFU per cm² of the effective filter area.
- c. the established holding time has been properly validated.
- d. the deviation does not compromise the quality of the product and is documented and justified.
- e. Quality Assurance and Manufacturing has been notified and approves of the deviation.

Corresponds to task #61.

29. Staff organization, methods validation, and handling of documentation in a pharmaceutical manufacturing microbiology quality control laboratory are regulated by:

- a. the FDA 483 findings.
- b. Good Laboratory Practices.
- c. the Establishment Inspection Report.
- d. current Good Manufacturing Practices.
- e. ISO 9000.

Corresponds to task #61.

ANSWERS

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|------|-------|-------|-------|-------|-------|
| 1. a | 6. e | 11. c | 16. a | 21. b | 26. a |
| 2. b | 7. d | 12. c | 17. c | 22. b | 27. d |
| 3. d | 8. c | 13. a | 18. b | 23. c | 28. d |
| 4. d | 9. c | 14. a | 19. d | 24. c | 29. d |
| 5. e | 10. b | 15. a | 20. d | 25. c | |