

# Sample Questions

National Registry of Certified Microbiologists  
SM: Biological Safety Microbiology

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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. Which of the following definitions best describes disinfection?
  - a. The use of antimicrobial agents on inanimate objects to destroy all non-spore-forming organisms that could pose a hazard to humans or compromise the integrity of an experiment
  - b. Processing clean items to kill all living agents
  - c. Application of a liquid antimicrobial chemical to living tissue to prevent infection
  - d. Heat treatment of a liquid for the destruction of non-spore-forming organisms

**Corresponds to Task #1.**

2. Which one of the following disinfectants may spontaneously explode if it is stored too long in a stoppered container?
  - a. Peracetic acid
  - b. Beta-propiolactone
  - c. Formaldehyde
  - d. Sodium hypochlorite

**Corresponds to Task #2.**

3. The major advantage of steam sterilization over dry heat sterilization is that steam sterilization:
  - a. can be used for the sterilization of anhydrous materials.
  - b. kills a greater spectrum of organisms.
  - c. is not as destructive to materials.
  - d. sterilizes in less time.

**Corresponds to Task #3.**

4. Which one of the following practices would fail to provide personnel protection during the use of a biological safety cabinet?
  - a. Locating aerosol-producing equipment at the rear of the cabinet.
  - b. Moving all materials away from the front cabinet grille.
  - c. Moving bulky items to one side of the cabinet.
  - d. Performing manipulations so that work flows across the work surface from the contaminated area to the clean area.

**Corresponds to Task #4.**

5. Which one of the following practices best prevents worker exposure to infectious aerosols?
  - a. Balancing the safety cups prior to placing them in the centrifuge
  - b. Opening the centrifuge safety cups only in the biological safety cabinet
  - c. Using a splash shield to open rubber-stoppered tubes
  - d. Wearing a surgical mask while performing work

**Corresponds to Task #5.**

6. A team from a large pharmaceutical firm plans to do an audit of a production facility in which attenuated viral hepatitis A is grown in a bioreactor. Before the team can enter the work area they would each have to be:
  - a. trained in the use of the appropriate personal protective equipment.
  - b. evaluated for immunocompetency.
  - c. immunized with hepatitis A vaccine, for product and personal protection.
  - d. protected from infection with an injection of human gamma globulin.

**Corresponds to Task #7.**

7. Which of the following sampling methods is the most appropriate for determining microbial contaminants on surfaces?

- a. Sieve sampler
- b. Settling plate
- c. RODAC plate
- d. Slit-to-agar sampler

**Corresponds to Task #8.**

8. Which one of the following fungi is most likely to cause a laboratory-acquired infection if handled improperly?

- a. *Aspergillus fumigatus*
- b. *Candida albicans*
- c. *Sporothrix schenckii*
- d. *Coccidioides immitis*

**Corresponds to Task #16.**

9. The respiratory ID<sub>50</sub> (number of organisms required to produce infection in half of individuals exposed) for *Mycobacterium tuberculosis* is on the order of:

- a. fewer than 10.
- b. 100.
- c. 1,000.
- d. 10,000.

**Corresponds to Task #17.**

10. Exposure to *Legionella pneumophila* has been associated with:

- a. pet shops.
- b. gold mines.
- c. cooling towers.
- d. laundries.

**Corresponds to Task #24.**

11. In a rabies-free colony of laboratory dogs and cats, the most likely cause of bite-wound infection is:

- a. *Staphylococcus aureus*.
- b. *Bartonella henselae*.
- c. *Pasteurella multocida*.
- d. *Mycoplasma* spp.

**Corresponds to Task #27.**

12. The Occupational Safety and Health Administration (OSHA) requires an exposure control plan for:

- a. any site using biohazardous materials.
- b. any site using human blood or body fluids.
- c. any site that has research animals.
- d. any site that has had a spill of biohazardous materials.

**Corresponds to Task #29.**

13. The principal independent standard that is used for the design, manufacture, and testing of biological safety cabinets is:

- a. Federal Standard No. 209B.
- b. Centers for Disease Control and Prevention/National Institutes of Health (CDC/NIH), *Primary Containment for Biohazards: Selection, Installation and Use of Biological Safety Cabinets* guidelines.
- c. National Institutes of Health (NIH) 112C.
- d. NSF International Standard/American National Standard (NSF/ANSI) 49

**Corresponds to Task #36.**

14. Which one of the following combinations of containment methods best describes Biosafety Level 3?
- All work conducted in a Class II biosafety cabinet or other physical containment device, directional airflow from the corridor into the laboratory, and double-door access to the laboratory.
  - Laboratory located in separate zone or building, work conducted in a Class III biological safety cabinet, and all materials decontaminated before leaving the laboratory
  - Negative-pressure air environment, limited access, and hand-washing capability
  - Hand-washing sink, limited laboratory access, and cultures decontaminated before disposal

**Corresponds to Task #40.**

15. Which one of the following agents or toxins requires registration with U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA, APHIS) under the Agriculture Bioterrorism Protection Act (Title 9 CFR Part 121)?
- 5.0 mg staphylococcal enterotoxin
  - A genetic element that can be expressed in vivo containing the gene encoding the *Bacillus anthracis* lethal factor toxin.
  - 500 mg Shiga toxin
  - 5 liters of *E. coli* O157:H7, which produces Shiga-like toxin

**Corresponds to Task #41.**

16. According to the National Institutes of Health (NIH) *Guidelines for Research Involving Recombinant DNA Molecules*, an Institutional Biosafety Committee (IBC):
- shall consist of a minimum of 25 members of the institute.
  - shall include at least two members with no affiliation to the institution.
  - shall include members with expertise in plasmid methodology.
  - shall include at least one physician on the committee.

**Corresponds to Task #42.**

17. The vaccine that must be offered to personnel working with human blood cells is:

- hepatitis A virus.
- hepatitis B virus.
- tetanus.
- malaria.

**Corresponds to Task #45.**

18. The best reason for preparing an outline of a biological safety training program is to:

- provide evidence of training for the Occupational Safety and Health Administration (OSHA).
- distinguish biological safety training from programs dealing with radiation and chemicals.
- define biosafety levels.
- assure consistency in the content of the program each time it is delivered.

**Corresponds to Task #48.**

19. Steam autoclaving is appropriate for which of the following items?

- Nitrocellulose centrifuge tubes
- Instrument pans containing equipment soaking in bleach
- Polycarbonate Petri dishes
- Reusable bronchoscopes

**Corresponds to Task #53.**

20. In a Class II, Type A2 biological safety cabinet:

- downward laminar flow splits 2-6 inches above work surface between front and rear grills.
- the minimum inward air flow is 75 linear feet per minute and the exhaust air is ducted.
- cabinets cannot be used with minute quantities of volatile toxic chemicals and tracer amounts of radionucleotides.
- HEPA-filtered air from the cabinet is not re-circulated to the room.

**Corresponds to Task #54.**

21. The face velocity (inward air flow) of Class I and Class II biological safety cabinets should be in the range of:

- a. 25-50 linear feet per minute.
- b. 75-100 linear feet per minute.
- c. 100-150 linear feet per minute.
- d. 150-200 linear feet per minute.

**Corresponds to Task #55.**

22. The dispensing of uninoculated primary rhesus monkey kidney tissue culture into sterile culture tubes is most appropriately conducted in a:

- a. Class I biological safety cabinet.
- b. Class II biological safety cabinet.
- c. vertical laminar flow clean bench.
- d. horizontal laminar flow clean bench.

**Corresponds to Task #55.**

23. Which one of the following is a primary containment device?

- a. Centrifuge rotor
- b. Plastic animal cage
- c. Clean air bench
- d. Horsfall cage

**Corresponds to Task #62.**

24. Which containment equipment item is best associated with Biosafety Level 3?

- a. Class II biological safety cabinet
- b. Handwashing sink
- c. Horizontal laminar airflow clean bench
- d. Sharps containers

**Corresponds to Task #62.**

25. A Biosafety Level 3 facility should have which type of air pressurization?

- a. Neutral
- b. Positive
- c. Negative
- d. Atmospheric

**Corresponds to Task #65.**

### ANSWERS

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