

GATE XL

Daily practice paper (MICROBIOLOGY)

"control of Microorganisms":

1. Multiple-Choice Question (MCQ)

Which of the following methods is most effective for sterilizing heat-sensitive liquids?

- A) Dry heat sterilization
- B) Autoclaving
- C) Membrane filtration
- D) Pasteurization

Answer: C) Membrane filtration

2. Multiple-Choice Question (MCQ)

Which of the following disinfectants disrupts microbial membranes by interacting with phospholipids?

- A) Alcohols
- B) Halogens
- C) Heavy metals
- D) Alkylating agents

Answer: A) Alcohols

3. Numerical Answer Type (NAT)

A batch of bacterial spores has a **D-value of 2 minutes** at **121°C**. If an initial population of **10^6 spores** is present, how many minutes are required to reduce the population to **10 spores**?

Answer: 12 minutes

(Each D-value reduces the population by **90%**; reducing from **10^6 to 10** requires **6 D-values**, i.e., $6 \times 2 = 12$ minutes.)

4. Multiple-Choice Question (MCQ)

Which of the following mechanisms is used by **ionizing radiation** to sterilize materials?

- A) Formation of thymine dimers
- B) Generation of free radicals
- C) Denaturation of proteins
- D) Disruption of cell membrane

Answer: B) Generation of free radicals

5. Multiple-Select Question (MSQ)

Which of the following factors influence the efficiency of antimicrobial agents?

- A) Population size of microorganisms
- B) Concentration of the disinfectant
- C) Presence of organic matter
- D) Color of the microbial culture

Answer: A), B), and C)

