

Heat Transfer in Pharmaceutical Technology

Pharmaceutical Technology · Answer Key · 10 Questions

1. What are the three primary modes of heat transfer?

- A) Conduction, Convection, Radiation**
- B) Evaporation, Condensation, Sublimation
- C) Filtration, Distillation, Extraction
- D) Oxidation, Reduction, Hydrolysis

2. Which mode of heat transfer occurs through direct contact between molecules?

- A) Conduction**
- B) Convection
- C) Radiation
- D) Refraction

3. Conduction is most commonly observed in which pharmaceutical components?

- A) Solid materials like reactor walls, pipes, and equipment**
- B) Circulating gases inside drying chambers
- C) Boiling liquid solutions
- D) Electromagnetic radiation emitters

4. Convection heat transfer occurs through the movement of which states of matter?

- A) Fluids (liquids or gases)**
- B) Rigid solids only
- C) Pure vacuums
- D) Plasma exclusively

5. Which process transfers heat via electromagnetic waves?

- A) Radiation**
- B) Conduction
- C) Convection
- D) Induction

6. What is the primary objective of heat sterilization in pharmaceutical manufacturing?

- A) Using high temperatures to kill microorganisms**
- B) Cooling liquid solutions to form crystals
- C) Filtering out suspended solid particles
- D) Increasing the solubility of insoluble solids

7. Which device is commonly used for sterilizing equipment and materials via heat?

- A) Autoclave**
- B) Spray dryer
- C) Centrifuge
- D) Fluidized bed dryer

8. Thermal sterilization is applied to inactivate microorganisms in which type of product?

- A) Parenteral solutions**
- B) Dry powders
- C) Solid tablets
- D) Oily ointments

9. What is spray drying used for in pharmaceutical manufacturing?

- A) Drying liquid solutions or suspensions into powdered form**
- B) Sterilizing equipment using high-pressure steam
- C) Freezing liquid formulations for long-term storage
- D) Heating solid reactor walls through direct contact

10. Convection is important in which set of pharmaceutical processes?

- A) Heating and cooling of solutions, drying, and sterilization**
- B) Solid-state tablet compression
- C) Direct heat transfer through solid metal walls
- D) Electromagnetic wave emission