1. What is the primary factor influencing the dispersion of air pollutants in the atmosphere?

a) Humidity

b) Wind velocity

c) Temperature lapse rate

d) Atmospheric pressure

Answer: b) Wind velocity

Explanation: Wind velocity plays a crucial role in dispersing air pollutants by carrying them away from their source. Higher wind speeds facilitate faster dispersion and dilution of pollutants in the atmosphere.

2. Which atmospheric condition contributes to the stability of pollutants near the surface?

a) Inversion

b) Adiabatic cooling

c) High humidity

d) Convective mixing

Answer: a) Inversion

Explanation: Inversion occurs when a layer of warm air traps cooler air near the surface, preventing vertical mixing. This stable condition can lead to the accumulation of pollutants, worsening air quality.

3. What effect does a steep temperature lapse rate have on air pollution dispersion?

a) Decreases dispersion

b) Increases dispersion

c) Has no effect

d) Leads to inversion

Answer: b) Increases dispersion

Explanation: A steep temperature lapse rate indicates rapid cooling with altitude, promoting vertical mixing and dispersion of pollutants, thereby improving air quality.

4. What does the Gaussian Plume Model primarily describe?

a) Particle size distribution

b) Dispersion of air pollutants

c) Acid rain formation

d) Global warming trends

Answer: b) Dispersion of air pollutants

Explanation: The Gaussian Plume Model is a mathematical model used to predict the dispersion of pollutants emitted from point sources in the atmosphere, considering factors like wind speed, stability, and source characteristics.

5. Which meteorological factor influences turbulence, affecting the dispersion of pollutants?

a) Wind velocity

b) Temperature lapse rate

c) Atmospheric pressure

d) Humidity

Answer: a) Wind velocity

Explanation: Wind velocity influences turbulence in the atmosphere, impacting the dispersion of pollutants by promoting mixing and dilution of pollutants with clean air.

6. What characterizes the behavior of a plume in stable atmospheric conditions?

a) Rapid vertical dispersion

b) Horizontal spread

c) Minimal dispersion

d) Chaotic movement

Answer: c) Minimal dispersion

Explanation: In stable atmospheric conditions, the movement of a plume is restricted, leading to minimal dispersion and potential accumulation of pollutants near the source.

7. What phenomenon occurs when warm air rises and cools adiabatically, promoting vertical mixing?

a) Inversion

b) Turbulence

c) Convection

d) Subsidence

Answer: c) Convection

Explanation: Convection involves the transfer of heat through the movement of fluid (air, in this case). Warm air rises, cools adiabatically, and promotes vertical mixing, aiding in the dispersion of pollutants.

8. How does an increase in turbulence affect air pollution dispersion?

a) Reduces dispersion

b) Enhances dispersion

c) Causes inversion

d) Leads to acid rain

Answer: b) Enhances dispersion

Explanation: Increased turbulence in the atmosphere promotes mixing, aiding in the dispersion of pollutants and ultimately improving air quality.

9. Which factor contributes to the horizontal spread of pollutants in the atmosphere?
a) Wind velocity
b) Temperature lapse rate
c) Stability
d) Humidity

Answer: a) Wind velocity
Explanation: Wind velocity plays a crucial role in the horizontal spread of pollutants by carrying them away from their source over large distances.

10. What does the Gaussian Plume Model assume about the dispersion of pollutants in the atmosphere?
a) Linear dispersion pattern
b) Random dispersion
c) Uniform dispersion
d) Gaussian distribution

Answer: d) Gaussian distribution
Explanation: The Gaussian Plume Model assumes that the dispersion of pollutants in the atmosphere follows a Gaussian (bell-shaped) distribution pattern, with the highest concentration near the source gradually decreasing with distance.