

Environmental Health and Human Physiology

Environmental Science · Practice Test · 12 Questions

1. Which specific atmospheric pollutant is known to form carboxyhemoglobin in human blood, thereby reducing the oxygen-carrying capacity of the body?

- A) Sulfur dioxide
- B) Carbon monoxide
- C) Nitrogen dioxide
- D) Ozone

2. In the context of heavy metal toxicity, which enzyme is primarily inhibited by lead (Pb) exposure, leading to the disruption of heme biosynthesis and subsequent anemia?

- A) Delta-aminolevulinic acid dehydratase
- B) Cytochrome c oxidase
- C) Superoxide dismutase
- D) Pyruvate kinase

3. What is the biological mechanism by which perfluorooctanoic acid (PFOA) is classified as an endocrine disruptor in humans?

- A) Direct binding to insulin receptors
- B) Interaction with peroxisome proliferator-activated receptors (PPARs)
- C) Inhibition of thyroid peroxidase
- D) Activation of estrogen receptors

4. Fine particulate matter (PM2.5) exposure is associated with systemic inflammation; which systemic inflammatory marker is most commonly elevated in long-term epidemiological studies?

- A) C-reactive protein (CRP)
- B) Creatinine
- C) Albumin
- D) Bilirubin

5. The bioaccumulation of methylmercury in humans primarily affects the central nervous system due to its high affinity for which chemical functional group found in proteins?

- A) Carboxyl group
- B) Hydroxyl group
- C) Sulfhydryl (thiol) group
- D) Phosphate group

6. Which organ is the primary site of metabolism for polycyclic aromatic hydrocarbons (PAHs), and which enzyme system is responsible for their activation into carcinogenic epoxides?

- A) Liver; Cytochrome P450
- B) Kidneys; Monoamine oxidase
- C) Lungs; Glutathione S-transferase
- D) Skin; Dehydrogenase

7. Chronic exposure to arsenic in drinking water is clinically associated with the development of which specific type of skin lesion?

- A) Psoriatic plaques
- B) Palmoplantar hyperkeratosis
- C) Atopic dermatitis
- D) Melanoma in situ

8. What is the specific mode of action for dioxins (TCDD) that leads to their toxic effects on human health?

- A) Binding to the aryl hydrocarbon receptor (AhR)
- B) Inhibition of DNA polymerase
- C) Blocking of voltage-gated calcium channels
- D) Disruption of mitochondrial electron transport

9. Which atmospheric condition or pollutant is the primary catalyst for the formation of ground-level ozone, which exacerbates human respiratory distress?

- A) Particulate matter and methane
- B) Nitrogen oxides and volatile organic compounds (VOCs)
- C) Carbon dioxide and water vapor
- D) Chlorofluorocarbons and noble gases

10. In environmental toxicology, what is the significance of the 'half-life' of polychlorinated biphenyls (PCBs) in the human adipose tissue?

- A) They are rapidly excreted in urine
- B) They persist due to high lipophilicity and resistance to enzymatic degradation
- C) They are metabolized into harmless amino acids
- D) They are sequestered in the bone matrix only

11. Cadmium toxicity specifically targets which organ system, causing proximal tubular dysfunction and increased urinary excretion of low-molecular-weight proteins?

- A) Cardiac system
- B) Renal system
- C) Endocrine system
- D) Integumentary system

12. Which neurotoxic effect is commonly associated with chronic inhalation of manganese (Mn) in industrial settings, mimicking Parkinson's disease?

- A) Manganism
- B) Peripheral neuropathy
- C) Multiple sclerosis
- D) Altered circadian rhythm