

Advanced Human Physiology and Health

Biology · Answer Key · 25 Questions

1. Which specific hormone is primarily responsible for the stimulation of osteoclasts, thereby increasing blood calcium levels?

A) Calcitonin

B) Parathyroid hormone

C) Thyroxine

D) Aldosterone

2. The loop of Henle in the nephron is essential for concentrating urine; which process occurs in the descending limb?

A) Active transport of sodium

B) Passive reabsorption of water

C) Secretion of potassium

D) Active reabsorption of urea

3. Which immunoglobulin is the only one capable of crossing the human placenta to provide passive immunity to the fetus?

A) IgA

B) IgE

C) IgG

D) IgM

4. During the cardiac cycle, the 'lub' sound corresponds to which specific mechanical event?

A) Closure of the semilunar valves

B) Opening of the tricuspid valve

C) Closure of the atrioventricular valves

D) Contraction of the atria

5. Which cell type in the gastric glands of the stomach secretes intrinsic factor, necessary for vitamin B12 absorption?

A) Chief cells

B) Parietal cells

C) G-cells

D) Mucous cells

6. What is the primary function of the Kupffer cells found within the liver sinusoids?

- A) Bile production
- B) Phagocytosis of pathogens and debris**
- C) Glycogen storage
- D) Lipid metabolism

7. In human genetics, which term describes an individual who possesses two different alleles at a specific locus on homologous chromosomes?

- A) Homozygous
- B) Hemizygous
- C) Heterozygous**
- D) Polygenic

8. Which cranial nerve is primarily responsible for providing parasympathetic innervation to the thoracic and abdominal viscera?

- A) Trigeminal nerve
- B) Glossopharyngeal nerve
- C) Vagus nerve**
- D) Accessory nerve

9. The Hering-Breuer reflex is a mechanism that prevents what physiological outcome?

- A) Over-inflation of the lungs**
- B) Hypocapnia
- C) Cardiac arrhythmia
- D) Muscle fatigue

10. Which portion of the brain is the primary integration center for the endocrine and autonomic nervous systems?

- A) Thalamus
- B) Hypothalamus**
- C) Cerebellum
- D) Medulla oblongata

11. What is the physiological result of a mutation in the CFTR gene, characteristic of cystic fibrosis?

- A) Excessive potassium secretion
- B) Defective chloride ion transport**
- C) Impaired glucose metabolism
- D) Overproduction of hemoglobin

12. Which mineral is a required cofactor for the enzyme carbonic anhydrase, essential for CO₂ transport in red blood cells?

- A) Zinc**
- B) Magnesium
- C) Iron
- D) Calcium

13. Which layer of the skin contains the melanocytes responsible for producing melanin?

- A) Stratum corneum
- B) Stratum granulosum
- C) Stratum basale**
- D) Dermis

14. The Bohr effect describes the rightward shift of the hemoglobin-oxygen dissociation curve in response to which change?

- A) Increased pH
- B) Decreased temperature
- C) Increased partial pressure of CO₂**
- D) Decreased 2,3-BPG

15. Which protein is the most abundant in the human body, providing structural integrity to connective tissues?

- A) Keratin
- B) Myosin
- C) Collagen**
- D) Actin

16. What type of joint allows for the greatest range of motion in the human skeleton?

- A) Hinge joint
- B) Ball-and-socket joint**
- C) Pivot joint
- D) Saddle joint

17. The conversion of fibrinogen to fibrin during blood coagulation is catalyzed by which enzyme?

- A) Plasmin
- B) Prothrombin
- C) Thrombin**
- D) Heparin

18. Which specific region of the small intestine is the primary site for the absorption of iron?

A) Duodenum

B) Jejunum

C) Ileum

D) Cecum

19. What is the primary metabolic waste product excreted by the kidneys that originates from the breakdown of proteins?

A) Uric acid

B) Ammonia

C) Creatinine

D) Urea

20. Which vitamin is synthesized by commensal bacteria in the large intestine and is crucial for blood clotting factor synthesis?

A) Vitamin K

B) Vitamin D

C) Vitamin B12

D) Vitamin C

21. What is the name of the fluid-filled cavity within a secondary (Graafian) follicle?

A) Zona pellucida

B) Antrum

C) Theca externa

D) Corona radiata

22. Which cell type in the human immune system is responsible for the production of antibodies?

A) T-helper cells

B) Cytotoxic T cells

C) Plasma cells

D) Natural killer cells

23. The 'all-or-none' law refers to the electrical activity of which type of cells?

A) Epithelial cells

B) Neurons

C) Adipose cells

D) Fibroblasts

24. Which hormone, produced by the adrenal cortex, is essential for maintaining blood glucose levels during prolonged fasting?

- A) Epinephrine
- B) Aldosterone
- C) Cortisol**
- D) Testosterone

25. What is the primary stimulus for the release of erythropoietin by the kidneys?

- A) Hypercapnia
- B) Hypoxia**
- C) Hyperkalemia
- D) Hypertension