

Advanced Human Physiology and Health

Human Biology · Answer Key · 15 Questions

1. Which specific hormone is primarily responsible for the maturation of T-lymphocytes in the thymus?

A) Thymopoietin

B) Melatonin

C) Cortisol

D) Aldosterone

2. In the human nephron, which segment is exclusively impermeable to water under all physiological conditions?

A) Proximal convoluted tubule

B) Descending limb of Henle

C) Ascending limb of Henle

D) Collecting duct

3. Which cranial nerve is solely responsible for the motor innervation of the superior oblique muscle of the eye?

A) Abducens nerve

B) Oculomotor nerve

C) Trochlear nerve

D) Trigeminal nerve

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

A) Bile production

B) Phagocytosis of pathogens

C) Glycogen storage

D) Lipid emulsification

5. Which immunoglobulin isotype is most abundant in human colostrum and provides passive immunity to neonates?

A) IgG

B) IgM

C) IgA

D) IgE

6. The 'Circle of Willis' provides redundant blood flow to the brain via an anastomosis between which major arterial systems?

A) Internal carotid and vertebral arteries

B) External carotid and subclavian arteries

C) Basilar and axillary arteries

D) Common carotid and femoral arteries

7. What is the clinical term for the abnormal accumulation of fluid in the peritoneal cavity, often associated with liver cirrhosis?

A) Edema

B) Effusion

C) Ascites

D) Lymphedema

8. Which enzyme is the rate-limiting step in the cholesterol biosynthesis pathway?

A) HMG-CoA reductase

B) Acetyl-CoA carboxylase

C) Pyruvate dehydrogenase

D) Citrate synthase

9. What is the primary site of gas exchange in the human lungs where the blood-air barrier is thinnest?

A) Bronchioles

B) Alveolar sacs

C) Terminal bronchioles

D) Trachea

10. In hematopoiesis, which cell type is the immediate precursor to the mature erythrocyte?

A) Myeloblast

B) Reticulocyte

C) Proerythroblast

D) Megakaryocyte

11. Which part of the human brain is responsible for the regulation of circadian rhythms via the secretion of melatonin?

A) Hypothalamus

B) Pineal gland

C) Thalamus

D) Hippocampus

12. Which mineral is a necessary cofactor for the enzyme carbonic anhydrase found in red blood cells?

A) Magnesium

B) Zinc

C) Iron

D) Calcium

13. What is the primary protein component of the thick filaments within a skeletal muscle sarcomere?

A) Actin

B) Myosin

C) Tropomyosin

D) Troponin

14. Which specialized cells in the gastric mucosa secrete hydrochloric acid?

A) Chief cells

B) Parietal cells

C) G-cells

D) Mucous cells

15. What is the physiological role of the enzyme enterokinase (enteropeptidase) in the small intestine?

A) Digestion of lipids

B) Activation of trypsinogen to trypsin

C) Synthesis of vitamin B12

D) Absorption of glucose