

Biological Foundations of Mental Health

Mental Health · Answer Key · 20 Questions

1. Which neurotransmitter is primarily associated with the regulation of mood, sleep, and appetite?

- A) Acetylcholine
- B) Serotonin**
- C) Epinephrine
- D) Glutamate

2. The HPA axis, a complex set of direct influences and feedback interactions among three endocrine glands, stands for which of the following?

- A) Hypothalamus-Pituitary-Adrenal**
- B) Hippocampus-Pineal-Aorta
- C) Hypothalamus-Pineal-Amygdala
- D) Heart-Pancreas-Adrenal

3. Which brain structure is primarily responsible for the processing of fear and emotional responses?

- A) Cerebellum
- B) Amygdala**
- C) Thalamus
- D) Occipital lobe

4. What is the primary role of cortisol in the human body regarding stress?

- A) To promote serotonin production
- B) To increase blood glucose levels for energy**
- C) To inhibit insulin release in all cases
- D) To lower heart rate during exercise

5. Neuroplasticity, a key concept in mental health, refers to what?

- A) The hardening of brain tissue with age
- B) The ability of the brain to form new neural connections**
- C) The speed at which electrical signals travel
- D) The process of neurotransmitter reuptake

6. Chronic stress is known to cause a decrease in the volume of which brain area involved in memory and learning?

- A) Hippocampus**
- B) Brain stem
- C) Corpus callosum
- D) Pons

7. Which hormone is commonly referred to as the 'bonding hormone' and is involved in social recognition and trust?

- A) Thyroxine
- B) Oxytocin**
- C) Melatonin
- D) Adrenaline

8. The prefrontal cortex is most associated with which of the following functions?

- A) Basic motor skills
- B) Executive function and decision-making**
- C) Visual perception
- D) Regulation of body temperature

9. Deficiency in which vitamin is frequently linked to depressive symptoms and cognitive decline?

- A) Vitamin C
- B) Vitamin D**
- C) Vitamin K
- D) Vitamin A

10. What does the term 'neurogenesis' refer to in the context of the adult human brain?

- A) The death of neurons
- B) The growth and development of new neurons**
- C) The repair of damaged myelin sheaths
- D) The chemical transmission between synapses

11. Which part of the autonomic nervous system is responsible for the 'rest and digest' response?

- A) Sympathetic nervous system
- B) Parasympathetic nervous system**
- C) Enteric nervous system
- D) Central nervous system

12. The 'gut-brain axis' refers to the two-way communication between the central nervous system and which organ system?

- A) Enteric nervous system**
- B) Respiratory system
- C) Endocrine system
- D) Lymphatic system

13. Dopamine is a neurotransmitter primarily involved in which brain pathway?

- A) The pain reflex pathway
- B) The reward and motivation system**
- C) The visual processing system
- D) The tactile sensory system

14. Which sleep stage is most critical for emotional regulation and memory consolidation?

- A) Stage 1 (NREM)
- B) Stage 2 (NREM)
- C) Deep Sleep (Slow-wave sleep)
- D) REM Sleep**

15. What is the function of the blood-brain barrier?

- A) To transport oxygen to the brain
- B) To protect the brain from pathogens and toxins**
- C) To regulate neurotransmitter production
- D) To filter waste from spinal fluid

16. Which condition is characterized by an overactive sympathetic nervous system response to perceived threats?

- A) Anxiety disorders**
- B) Narcolepsy
- C) Aphasia
- D) Ataxia

17. The term 'myelination' in brain health refers to:

- A) The formation of fatty sheaths around axons to speed up electrical impulses**
- B) The destruction of synapses
- C) The production of new glial cells
- D) The movement of ions across the membrane

18. Chronic inflammation in the body has been scientifically linked to the increased risk of:

- A) Hyperthyroidism
- B) Clinical depression**
- C) Myopia
- D) Scoliosis

19. What is the primary role of GABA in the central nervous system?

A) To act as the main excitatory neurotransmitter

B) To act as the main inhibitory neurotransmitter

C) To increase heart rate

D) To initiate muscle contraction

20. The thalamus functions primarily as:

A) The brain's relay station for sensory information

B) The control center for hormonal balance

C) The area responsible for long-term memory storage

D) The center for balance and coordination