

Classical Music and Human Physiology

Classical Music · Answer Key · 20 Questions

1. Which specific hormone, often referred to as the 'stress hormone,' has been shown in clinical studies to decrease in concentration after listening to Mozart?

A) Cortisol

B) Adrenaline

C) Insulin

D) Thyroxine

2. Listening to music with a steady tempo of approximately 60 beats per minute, common in many Baroque compositions, is often associated with the induction of which brain wave state?

A) Beta waves

B) Alpha waves

C) Gamma waves

D) Delta waves

3. During a live orchestral performance, what physical phenomenon occurs due to 'entrainment' where the listener's heart rate tends to synchronize with the music's tempo?

A) Tachycardia

B) Bradycardia

C) Rhythmic synchronization

D) Cardiac arrhythmia

4. Which auditory region of the brain is primarily responsible for processing the complex pitch structures found in classical compositions?

A) Occipital lobe

B) Primary auditory cortex

C) Cerebellum

D) Frontal cortex

5. Research suggests that professional classical singers utilize which specific breathing technique to maintain steady airflow for long operatic phrases?

A) Hyperventilation

B) Apnea

C) Diaphragmatic breathing

D) Thoracic gasping

6. The 'Mozart Effect' study published in 1993 originally claimed a temporary improvement in what specific type of human cognitive processing?

A) Spatial-temporal reasoning

- B) Long-term memory
- C) Emotional intelligence
- D) Verbal fluency

7. Which neurotransmitter, involved in the brain's reward system, is released in higher concentrations when a listener experiences a 'musical chill' or peak emotional response to a classical piece?

A) Dopamine

- B) Serotonin
- C) GABA
- D) Glutamate

8. For string players, excessive repetitive practice of complex movements often leads to which musculoskeletal condition?

A) Osteoporosis

B) Tendonitis

- C) Scurvy
- D) Anemia

9. Classical music therapy is often used in clinical settings to lower blood pressure by stimulating which part of the autonomic nervous system?

A) Sympathetic nervous system

B) Parasympathetic nervous system

- C) Enteric nervous system
- D) Central nervous system

10. What is the term for the physical phenomenon where a sound wave matches the natural frequency of an object, such as the human vocal cords during opera?

A) Resonance

- B) Refraction
- C) Diffraction
- D) Dispersion

11. Which part of the brain is significantly activated during the sight-reading of complex musical scores, connecting visual input to motor output?

A) Corpus callosum

- B) Medulla oblongata
- C) Thalamus
- D) Pineal gland

12. Sustained exposure to high-decibel orchestral music without protection can cause damage to which structure within the inner ear?

- A) Eustachian tube
- B) Cochlear hair cells**
- C) Stapes
- D) Semicircular canals

13. Studies indicate that listening to classical music can assist in the recovery of patients post-surgery by reducing the need for what class of medication?

- A) Antibiotics
- B) Antihistamines
- C) Analgesics**
- D) Antacids

14. The act of playing a classical instrument like the piano requires high-level coordination between the left and right hemispheres, utilizing which bridge of nerve fibers?

- A) Corpus callosum**
- B) Cerebral cortex
- C) Brain stem
- D) Hypothalamus

15. Regular engagement in classical music performance has been linked to increased gray matter density in which area of the brain associated with motor control?

- A) Cerebellum**
- B) Hippocampus
- C) Amygdala
- D) Pons

16. What physiological effect does the 'tempo rubato' in Romantic-era music often have on a listener's perception of duration?

- A) Time contraction
- B) Time dilation**
- C) Sensory deprivation
- D) Synesthesia

17. Which vocal register, used frequently in classical soprano singing, requires specific tension changes in the cricothyroid muscles?

- A) Chest voice
- B) Head voice**
- C) Fry register
- D) Whisper voice

18. In neurologically impaired patients, rhythmic auditory stimulation (often using classical metronomic patterns) is used to rehabilitate which physical function?

A) Gait and motor movement

- B) Visual acuity
- C) Gustatory perception
- D) Olfactory memory

19. What is the primary sensory organ that converts the mechanical sound waves of a symphony into electrical impulses for the brain?

- A) The pinna
- B) The tympanic membrane

C) The organ of Corti

- D) The malleus

20. The binaural processing of orchestral sound allows the human brain to perform what spatial function?

A) Sound localization

- B) Color perception
- C) Depth perception
- D) Tactile feedback