## Done by:layan almuhaisen

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#### **CNS** Physiology

Q1. Which of the following best explains why cardiac pain may be perceived in the jaw?

A. The heart and jaw share a common cranial nerve

B. The pain fibers from both converge in the spinal trigeminal nucleus

C. They originate from the same embryonic dorsal roots

D. The jaw is more sensitive and overrides cardiac pain perception

Answer: C

Q2. Which structure is directly responsible for the inhibition of pain at the spinal level during stress-induced analgesia?

A. Medial forebrain bundle

B. Periaqueductal gray

C. Raphe magnus nucleus

D. Pain inhibitory complex in the dorsal horn

Answer: D

Q3. A soldier injured in battle does not feel pain until after the fight. Which neurotransmitter is most likely involved in this temporary analgesia?

A. Acetylcholine

B. Dopamine

C. Serotonin

D. Glutamate

Answer: C

Q4. Which of the following conditions is an example of referred pain commonly mistaken for a dental issue? A. Gingivitis B. Maxillary sinusitis C. Pulpitis D. Temporomandibular joint disorder Answer: B \_\_\_\_\_\_ Q5. A defect in serotonin reuptake mechanisms would MOST LIKELY result in: A. Reduced inhibitory modulation of pain

B. Enhanced transmission of pain signals

C. Increased muscle tone

D. Loss of voluntary movement

Answer: A



Q6. A neurotransmitter causes hyperpolarization in the postsynaptic neuron. Which type of postsynaptic potential is generated?

- A. Excitatory
- B. Neutral
- C. Inhibitory
- D. Rebound
- Answer: C

Q7. Which part of the CNS is the initial site of interpretation for sensory input like pain or temperature? A. Brainstem B. Thalamus

- C. Sensory cortex D. Cerebellum
- Answer C

Q8. Which pain receptor is most likely stimulated by exposure to capsaicin (from chili peppers)? A. Thermal receptor B. Mechanical receptor C. Chemical receptor D. Nociceptor Answer: C

Q9. If the synaptic vesicles in a neuron were depleted, what would be the immediate consequence for neural transmission? A. Postsynaptic hyperactivity B. Blocked neurotransmitter release C. Excessive depolarization D. Increased threshold potential Answer: B Q10. The action of endorphins in the CNS is most similar to: A. Increasing membrane permeability to sodium B. Activating pain receptors C. Inhibiting the release of neurotransmitters that carry pain D. Triggering muscle contraction

Answer: C



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#### Cerebral Cortex Physiology

Q1. A patient is unable to recognize objects by touch alone despite normal sensation. Which cortical area is most likely damaged?

A. Area 3 B. Area 1 C. Area 5 D. Area 4 Answer C Reasoning: Area 5 is involved in interpretation and stereognosis. Q2. Which of the following best reflects the principle of functional organization in Somatic Sensory Area I (SI)? A. Sensory input from both sides of the body is equally represented B. Each body part is represented proportionally to its physical size C. The representation is inverted and based on functional sensitivity D. The map remains fixed throughout life and is genetically predetermined Answer C Reasoning: SI representation is contralateral, inverted (except for the face), and proportional to function, not size. 03. Damage to Brodmann Area 4 on the left hemisphere would most likely result in: A. Global aphasia B. Right-sided paralysis of fine hand movements C. Loss of stereognosis D Visual hallucinations Answer B Reasoning: Area 4 controls fine voluntary movement contralaterally. Q4. Which combination best matches each Brodmann area with its function? A. 17 - Memory, 6 - Hearing B. 4 - Vision, 22 - Fine movement C. 6 – Gross movement, 22 – Auditory interpretation D. 5 - Vision, 45 - Motor speech Answer C 05. Which of the following best explains why the sensory cortex's representation is "changeable"? A. Cortical neurons regenerate quickly B. Representation adjusts with sensory experience C. It only activates during sleep D. It shifts with seasonal body rhythms

Answer B

Reasoning: Neuroplasticity allows sensory maps to adapt with experience.



Q6. A lesion in Brodmann Area 8 would most likely result in: A. Loss of voluntary eye movements to the opposite side B. Inability to form speech sounds C. Loss of reflex blinking D. Contralateral sensory loss Answer: A

Q7. Which cortical area potentiates the function of the primary somatic sensory cortex?

A. Area 5

B. Area 40

C. Area 6

D. Area 22 Answer: B

Answer: B

Q8. The primary motor cortex facilitates stretch reflexes. What does this suggest about its role? A. It reduces spinal excitability

B. It modulates spinal circuits for reflexive control

C. It prevents deep tendon reflexes

D. It inhibits associated movements

Answer: B

Q9. The sensory cortex representation is described as "inverted." What does this imply anatomically? A. The head is represented at the medial edge

B. The feet are represented near the lateral fissure

C. The lower limbs are represented medially

D. There is no consistent spatial pattern

Answer: C

Reasoning: Lower limbs lie medially; the homunculus is inverted.

Q10. Which of the following is a function of Broca's area (Area 44)? A. Interprets written words B. Programs muscle movement for speech C. Maintains auditory memory D. Controls visual fixation Answer: B.

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## Done by:layan almuhaisen

Autonomic Nervous System Physiology

Q1. During a high-stress situation, a patient exhibits bronchodilation and splenic contraction. What is the most likely cause?

A. Activation of parasympathetic nerves

B. Release of dopamine from the cerebellum

C. Sympathetic nervous system activation

D. Stimulation of the vagus nerve

Answer: C

Q2. Which of the following best explains why sympathetic stimulation increases skeletal muscle performance during stress?

A. Coronary vasodilation

B. Increase in blood glucose alone

C. Vasoconstriction of cerebral vessels

D. Increased blood flow and oxygen delivery to muscles (Orbelli phenomenon)

Answer: D

Q3. Which anatomical feature best differentiates sympathetic from parasympathetic outflow? A. Presence of ganglia B. Thoracolumbar origin vs. craniosacral origin C. Use of acetylcholine as a neurotransmitter

D. Involvement in glandular control

Answer: B

Q4. Which function is uniquely associated with the parasympathetic nervous system? A. Pupillary dilation B. Ejaculation in males

C. Bronchodilation

D. Promotion of digestion and diuresis

Answer: D

Q5. A patient has dry mouth with thick, enzyme-rich saliva. Which branch of the ANS is likely overactive? A. Parasympathetic via CN VII

B. Sympathetic fibers to the salivary glands

C. Enteric nervous system

D. Parasympathetic sacral outflow

Answer: B



Q6. Stimulation of the greater splanchnic nerve will lead to:

- A. Bronchoconstriction and decreased heart rate
- B. Increased glycogenolysis and GIT motility
- C. Increased adrenal secretion and reduced GIT motility
- D. GIT vasodilation and urination

Answer: C

Q7. Which of the following best describes the effect of sympathetic activity on cerebral blood vessels?

- ${\sf A}. {\it Strong}\ vaso constriction\ with\ reduced\ cerebral\ flow$
- B. Vasodilation due to direct sympathetic relaxation
- C. Weak vasoconstriction; overall flow maintained by blood pressure rise
- D. No effect on cerebral circulation

Answer: C

Q8. Why does sympathetic stimulation of the eye result in a wider visual field?

- A. Contraction of ciliary muscles improves focus
- B. Dilation of pupils and elevation of eyelids
- C. Relaxation of the iris sphincter muscles
- D. Activation of the optic nerve
- Answer: B

Q9. What is the primary neurotransmitter released from the adrenal medulla upon sympathetic stimulation? A. Acetylcholine

- B. Dopamine
- C. 80% adrenaline and 20% noradrenaline
- D. Serotonin
- Answer: C

Q10. Sympathetic stimulation of the male reproductive system leads to:

- A. Vasodilation and erection
- B. Ejaculation and inhibition of erection
- C. Urethral relaxation and increased libido
- D. Spermatogenesis
- Answer: B

