

考 試 科 目	生理學	系 所 別	神經科學研究所	考 試 時 間	2 月 5 日 (五) 第 2 節
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一、選擇題(每題 3 分，共 30 分)

- Which of the following organs does NOT secrete digestive enzymes?
(A) stomach
(B) intestine
(C) pancreas
(D) spleen
(E) all above organs secrete digestive enzymes.
- What type of cell is NOT found in the brain?
(A) GABA interneurons
(B) microglia
(C) Schwann cells
(D) oligodendrocytes
(E) norepinephrine neurons.
- Which of the following molecules is the principal neurotransmitter at the neuromuscular junctions?
(A) acetylcholine
(B) glutamate
(C) dopamine
(D) serotonin
(E) epinephrine.
- Which of the following is NOT the functions of hepatocytes?
(A) cholesterol metabolism
(B) secreting ghrelin
(C) producing bile
(D) detoxification
(E) synthesizing albumin.
- The heart rate is controlled by
(A) the activity of sympathetic nerves
(B) plasma levels of epinephrine
(C) the activity of parasympathetic nerves
(D) the activity of cardiovascular reflex

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(E) all of the above.

6. Adipose tissue plays crucial roles in metabolism regulation by secreting hormones called adipokines. Which of the following molecules is an adipokine?
- (A) insulin
 - (B) ghrelin
 - (C) glucagon
 - (D) prostaglandin
 - (E) leptin.
7. Exchange of O_2 and CO_2 between alveolar air and blood in lung capillaries by
- (A) bulk flow
 - (B) diffusion
 - (C) active transport
 - (D) transport proteins
 - (E) all of the above.
8. Which of the following is NOT the functions of kidney?
- (A) Recycling red blood cells
 - (B) producing erythropoietin
 - (C) regulating blood pressure
 - (D) maintaining the balance of the concentrations of electrolytes
 - (E) regulating osmotic pressure.
9. Hippocampus is involved in
- (A) spatial navigation
 - (B) motor coordination
 - (C) circadian rhythm
 - (D) regulating autonomous nervous system
 - (E) all of the above.
10. Which of the following molecules is NOT a neurotransmitter in the brain
- (A) glutamate
 - (B) GABA
 - (C) epinephrine

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<p>(D) norepinephrine (E) histamine</p> <p>二、名詞解釋 (20 分)</p> <p>(A) axoplasmic transport (B) synaptic plasticity (C) visual cortex (D) neuropeptide</p> <p>三、問答題 (每題 10 分，共 50 分)</p> <p>1. Covid-19 outbreak has caused not only severe impacts on people's livelihood, but also enormous social and economic disruptions. Please explain (A) the antiviral responses of innate immune system, and (B) the principles of antiviral actions of vaccine (10pts).</p> <p>2. Please compare the downstream reactions after a (A) ion channel-coupled (B) G protein-coupled neurotransmitter receptor binds to its ligand (10pts).</p> <p>3. Explain the link between hypothalamic-pituitary-adrenal axis and the pathogenesis of major depressive disorder (10pts).</p> <p>4. Describe (A) how the resting membrane potential is established, and (B) the propagation of an action potential in a neuron (10pts).</p> <p>5. List 4 experimental methods that can be used for studying the causes or the mechanisms of mental disorders, such as schizophrenia, and briefly explain their principles (10pts).</p>					
備 註	<p>一、作答於試題上者，不予計分。 二、試題請隨卷繳交。</p>				