國立清華大學命題紙

八十七學年度輻射生物研究所系(所)＿＿＿＿組碩士班研究生入學考試

科目 生理學 科號 404 共 2 頁第 1 頁 *請在試卷【答案卷】內作答

1. Describe briefly the phosphatidylinositol-4-phosphate (PIP) system in signal transduction. (5%)

2. Please describe the mechanism of secretion of HCl by parietal cells. (10%)

3. a. Please list 5 anterior pituitary hormones and briefly describe their functions (10%)

   b. Describe the effects of 5 hypothalamic hormones which control the function of anterior pituitary. (5%)

4. Describe the pathway that tissue CO_2 is transported and expelled from the body. Discuss the biochemical mechanism that makes the pathway possible. (10%)

5. Write down the general structure of: (10%)

   a. fatty acids

   b. triglycerides

   c. phospholipids

   d. amino acids

6. Describe the following membrane properties of an excitable cell:

   a. resting membrane potential (3%)

   b. equilibrium potential of sodium ions (3%)

   c. action potential (4%)

7. Describe how a sound wave is transformed into electric signals by the hair cells in our ears. (10%)

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科目 生理學 科號 1404 共 2 頁第 2 頁 *請在試卷【答案卷】內作答

8. Nitric oxide is produced by endothelium cells upon exposure to acetylcholine in the blood stream. Please describe the process of NO production in endothelium cells and describe how vasodilation response is produced by NO generated in endothelium cells. (10%)

9. Describe how an impulse traveling down the axon of a motor neuron initiates the contraction of the target muscle of this motor neuron. (10%)

10. Please describe how the glomerular filtration rate of a kidney is determined by using inulin. (10%)