

國立臺灣海洋大學 101 學年度研究所碩士班暨碩士在職專班入學考試試題

考試科目：生理學

系所名稱：生物科技研究所碩士班甲組

1. 答案以橫式由左至右書寫。2. 請依題號順序作答。

1. Neurons are treated a drug that instantly and permanently stops the  $\text{Na}^+/\text{K}^+$  ATPase pumps. Assume for this question that pumps are not electrogenic. What happens to the resting membrane potential immediately and over time? (10%)
2. If the enzyme acetylcholinesterase were blocked with a drug, what malfunctions would occur in the heart and skeletal muscle? (10%)
3. Describe several mechanisms by which pain could theoretically be controlled medically or surgically. (10%)
4. Explain the following terms: (10%)  
(1)electroencephalogram(EEG) (2) transferrin (3)erythropoietin  
(4)angina pectoris (5)hypertension
5. What neurotransmitters/receptors might be effective targets for drugs used to prevent the muscle spasms characteristic of the disease tetanus? (10%)
6. During pregnancy, there is an increase in the liver's production and, consequently, the plasma concentration of the major plasma binding protein for the thyroid hormones (TH). This causes a sequence of events involving feedback that results in an increase in the plasma concentration of TH but no evidence of hyperthyroidism. Describe the sequence of events. (10%)
7. Describe the spread of excitation from the SA node through the rest of the heart. (10%)
8. Draw and label a normal ECG. Relate the P, QRS, and T waves to the atrial and ventricular action potentials. (10%)
9. Name three hormones produced by the ovaries and name the cells that produce them. (5%)
10. List the effects of FSH and LH on the follicle. (5%)
11. How do the kidneys maintain a stable plasma hydrogen ion? (10%)