

國立成功大學

113學年度碩士班招生考試試題

編 號：255

系 所：生理學研究所

科 目：生理學

日 期：0202

節 次：第 2 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. A person expresses a systolic pressure of 180 mmHg, a diastolic pressure of 90 mmHg, a heart rate of 90 bpm and a stroke volume 70 mL/beat. Please answer the following questions. (16 points)
 - (1) What is the pulse pressure?
 - (2) What is the mean arterial pressure?
 - (3) What is the cardiac output?
 - (4) What is the total peripheral resistance?
2. Draw an action potential on a graph of membrane potential versus time. Indicate zero membrane potential, resting membrane potential and threshold potential. Also, indicate when the membrane is depolarized, repolarized and hyperpolarized. (12 points)
3. Our body has mechanisms for limiting clot formation itself and for dissolving a clot after it has formed. Please describe the endogenous and physiological anti-clotting systems in our body. (12 points)
4. Please describe the separate mechanisms activated in photoreceptor cells in the presence and in the absence of light. (12 points)
5. A patient is observed to have symptoms that are consistent with elevated concentration of epinephrine in the blood including a rapid heart rate, anxiety and elevated fatty acid concentrations. However, after the blood sample is collected, the circulating epinephrine concentration is tested and found to be in the normal range. What might explain this? (12 points)
6. What are the physiological functions of the kidneys? (12 points)
7. I have dumplings and a cup of sweet and sour soup (酸辣湯) as my lunch. (12 points)
 - (1) Please describe the related digestive processes and those nutrients I will receive from this meal.
 - (2) Furthermore, I express a sickness of diarrhea after the meal. Please explain the involvement of GI system in this symptom.
8. When we go to the Alishan mountain (阿里山), we might experience the hypoxia at the high altitude. How can our body display an acclimatization to this hypoxia and confirm well oxygen supply to the tissues? (12 points)