

※ 考生請注意：本試題 可 不可 使用計算機

1. Explain why depletion of intracellular ATP reserves increases the contractility of the cardiomyocyte given that there are  $\text{Na}^+\text{-K}^+$  pumps,  $\text{Ca}^{2+}$  pumps, and  $\text{Na}^+\text{-Ca}^{2+}$  countertransporters on the plasma membrane of the cell. (15%)
2. Explain how electrical stimulation of the periaqueductal gray area in the midbrain suppresses pain signals entering the dorsal horns of the spinal cord. (20%)
3. Describe how gallstones are formed and the consequences of blocking the common bile duct with a gallstone. (15%)
4. Describe the compensatory mechanism of arterial baroreceptor reflex and how the kidney responds to hemorrhage shock. (25%)
5. Describe the forces determining fluid movement across the capillaries. Alteration of these forces can cause edema. Please explain why edema occurs in patient with liver disease. (10%)
6. Explain two methods for birth control. If you want to develop a new contraceptive, what would you work on? (15%)