

※ 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. Compare the source of  $\text{Ca}^{++}$  and the mechanisms by which an increase in cytosolic  $\text{Ca}^{++}$  concentration initiate contraction in skeletal and smooth muscle. (20%)
2. (a), What causes heart murmurs in diastole? and in systole? (b), What are the effects and mechanisms of sympathetic stimulation on cardiac output? (c), What is Frank-Starling mechanism (Starling's law of the heart)? (20%)
3. Describe how do the lung and kidneys respond to the presence of metabolic acidosis? (10%)
4. What factors stimulate pancreatic  $\text{HCO}_3^-$ , lipase, and insulin secretion? (20%)
5. For pregnancy to occur, the fertilization, implantation, and placentation are required. (a), Where does fertilization normally occur? (b), Describe the events that occur during fertilization and the block to polyspermy. (c), State the sources and maternal concentration changes of chorionic gonadotropin, estrogen, and progesterone during different stages of pregnancy. (30%)