

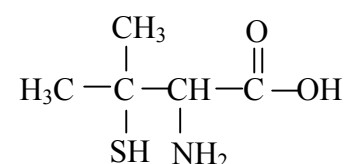
# 國立嘉義大學九十三年學年度 生物科技研究所碩士班招生考試試題

## 科目：專業英文

1. In extracellular fluids such as blood, the sulfhydryl groups of cysteine are quickly oxidized to form cystine. Unfortunately, cystine is the least soluble of the amino acids. In a genetic disorder known as cystinuria, defective membrane transport of cystine results in excessive excretion of cystine into the urine. Crystallization of the amino acid results in formation of calculi (stones) in the kidney, ureter, or urinary bladder. The stones may cause pain, infection, and blood in the urine. Cystine concentration in the kidney is reduced by massively increasing fluid intake and administering D-penicillamine. It is believed that penicillamine is effective because penicillamine-cysteine disulfide, which is substantially more soluble than cystine, is formed. ( 20 % )

### Questions:

- (1) According to this article, please suggest the way(s) by that the formation of calculi could be prevented.
- (2) The structure of penicillamine is shown as below. What is the structure of the penicillamine-cysteine disulfide?



2. Chromatography, the separation of soluble substances by their rates of movement through an insoluble matrix, is a technique for purifying molecules by charge (ion exchange chromatography), hydrophobicity (hydrophobic interaction chromatography), size (gel filtration chromatography), and binding properties (affinity chromatography). Binding and elution often depend on the salt concentration and pH. ( 10 % )

Choose a chromatography method that would be the best to be used in the following applications, and briefly explain the reason.

- (1) The separation of incorporated  $^{32}\text{P}$ -dATP from the labeled DNA after a radioactive labeling reaction.

- (2) Separating a mixture of two proteins with similar molecular weight, but with very different isoelectric points (e.g. pI = 5.8, and 7.5 respectively)

### 3. Briefly define the following terms: ( 20 % )

- (1) Hyperglycemia
- (2) Hypotonic effect
- (3) Bacterial transformation.
- (4) X-ray crystallography
- (5) Isoelectric focusing

### 4. 閱讀下列文字，以完成下方之翻譯題與是非題：

Anabolic steroids are synthetic androgens (male hormones) that promote protein synthesis in muscles and other organs. Use of these drugs by bodybuilders, weightlifters, and others is prohibited by most athletic organizations. Although administration of exogenous androgens does promote muscle growth, it can also cause a number of undesirable side effects. Since the liver and adipose tissue can exchange androgens into estrogens, male athletes who take exogenous androgens often develop *gynecomastia*—an abnormal growth of femalelike mammary tissue.

### 翻譯題：(15%)

- (1) Please translate the first three sentences into Chinese.

是非題 (對的寫 O，錯的寫 X)：10%(每題 2 分)

- (2) Anabolic steroids are artificial hormones.
- (3) It is allowed to use anabolic steroids for athlete in the sport games
- (4) Androgen is derived from estrogen in the liver and adipose tissue.
- (5) The female athletes who take exogenous androgens often develop malelike mammary tissue.
- (6) Anabolic steroids promotes muscle growth.

背面尚有試題

5. 閱讀下列文字，以完成下方之翻譯題與選擇題：

The kidney transport a number of molecules from the blood filtrate (which will become urine) back into the blood. Glucose, for example, is normally completely reabsorbed so that urine is normally free of glucose. If the glucose concentration of the blood and filtrate is too high (a condition called hyperglycemia), however, the transport maximum will be exceeded. In this case, glucose will be found in the urine (a condition called *glycosuria*). This may result from the consumption of too much sugar or from inadequate action of the hormone insulin in the disease *diabetes mellitus*.

翻譯題：(13%)

(1) Please translate the first four sentences into Chinese.

選擇題(單選題)：12%(每題 3 分)

- (2) *glycosuria* means (A) too many glucose in the blood. (B) too many glucose in the urine. (C) no glucose in the blood. (D) no glucose in the urine.
- (3) In normal condition of the body, (A) glucose is partially reabsorbed in the kidney. (B) glucose is leak out into urine. (C) no glucose in the blood. (D) no glucose in the urine.
- (4) If one person eats too much sugar, he or she is most likely to have (A) glucose in the urine. (B) no glucose in the urine. (C) little glucose in the blood. (D) normal glucose level in the urine.
- (5) Those persons who have disease *diabetes mellitus*, are likely to have the following condition except: (A) inadequate amount of insulin. (B) high level of glucose in the blood. (C) free of glucose in the urine. (D) high level of glucose in the urine.