

國立臺北科技大學 115 學年度碩士班招生考試

系所組別：3601

化學工程與生物科技系生化與生醫工程碩士班

第一節 生物化學 試題 (選考)

第 1 頁 共 2 頁

注意事項：

1. 本試題有單選題 6 題，每題 5 分，問答題 7 題，每題 10 分，共 100 分。
2. 不必抄題，作答時請將試題題號及答案依照順序寫在答案卷上。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

單選題：

1. () Which of the following human enzymes is present only in liver cells but not in muscle cells? (5 分)
 - A. glycogen synthase
 - B. hexokinase
 - C. glucose-6-phosphatase
 - D. lactate dehydrogenase
 - E. phosphoglucomutase
2. () In the citric acid cycle, which enzyme is located on the membrane? (5 分)
 - A. acronitase
 - B. succinate dehydrogenase
 - C. citrate dehydrogenase
 - D. succinyl-CoA synthetase
 - E. fumarase
3. () In the sequence of a water-soluble protein, the α -helix structure is most easily disrupted by the presence of which amino acid? (5 分)
 - A. glycine
 - B. proline
 - C. serine
 - D. glutamate
 - E. phenylalanine
4. () Which molecule is responsible for transporting fatty acids across the inner mitochondrial membrane? (5 分)
 - A. Coenzyme Q
 - B. Carnitine
 - C. lipoic acid
 - D. vitamin C
 - E. ATP
5. () During translation, which codon most commonly appears as the first amino acid codon? (5 分)
 - A. AUG
 - B. UAA
 - C. UGU
 - D. GCU
 - E. CAU
6. () The common table sugar is _____. (5 分)
 - A. glucose
 - B. galactose
 - C. lactose
 - D. fructose
 - E. sucrose

問答題：

1. A lysozyme molecule is composed of approximately 148 amino acids. If you have 1 g of this protein, approximately how many protein molecules does this represent? (10 分)
2. What is the mechanism of using SDS-PAGE to separate proteins? (10 分)
3. What is the biochemical mechanism/principle behind ethanol production by yeast? (10 分)
4. How can enzymes carry out highly efficient and specific catalytic reactions in a complex chemical environment of cells? (10 分)
5. Are essential amino acids the same for every organism? Which essential amino acids are required by humans to maintain normal physiological functions? (10 分)

6. Why is it generally easier for humans to gain body fat than to lose it? (From a metabolic viewpoint) (10 分)
7. What characteristic of mitochondria allows them to rapidly initiate ATP synthesis when the cell provides suitable conditions? (10 分)