

1. Describes the amount of energy released during the aerobic and anaerobic glucose catabolism and their linkage to ATP formation. (8%)
2. Describes the role of plasma membrane G-protein. (8%)
3. Describes the two processes by which amino group are removed from amino acids. (7%)
4. What properties are characteristic of lipids and how many subclasses of lipids. (7%)
5. There are two kinds of enzyme inhibition (or activation), reversible and irreversible, and both are involved in cellular physiological functions. The enzymes under these inhibitions (or activation) will exist either covalently or non-covalently changes of enzyme structure. Explain:
 - (a) what type of enzyme inhibition (or activation) is involved in cellular signal transduction and give at least one example to show the signal flow in cells or tissues. (5%)
 - (b) allosteric enzymes are defined as reversible non-covalently changes of enzyme function. Describe the principle biochemical properties of these enzymes. (5%)
6. Galactosemia, a kind of genetic disorders in human involves a failure to metabolize galactose. Describe:
 - (a) the different enzymatic processes blocked in the three common forms of galactosemia. (5%)
 - (b) the different clinical symptoms between galactosemia and lactose intolerance, and how to treat these genetic diseases. (5%)
7. The final fate of fatty acid degradation (β -oxidation) is 2-carbon acetyl-Coenzyme A. However, the biosynthesis of fatty acid requires precursor of 3-carbon malonyl-Coenzyme A.
 - (a) Describe the principle regulation between β -oxidation and biosynthesis of fatty acid in cells. (5%)
 - (b) Biosynthesis of fatty acid involves a multifunctional protein enzyme, the fatty acid synthase (also called multienzyme system). Define the multienzyme system and use eukaryotic fatty acid synthase a model to show the enzyme mechanism of multienzyme system. (10%)
8. Indicate the role of thioredoxin and glutathione in the synthesis of deoxyribonucleotides. (6%)
9. Why can fluorouracil be used as an anticancer drug? (5%)

(背面仍有題目,請繼續作答)

- 10 What is/are the biological role(s) of intron? How is intron removed in primary RNA transcript? (8%)
- 11 How do environmental factors regulate tissue-specific gene expression? (8%)
- 12 How does gene recombination generate diversity in the immune system? (8%)