

科目：

生物化學

系所組：

營養科學系

- I. Short assay questions: (40%; 4 questions, 10% each)
 1. Explain the pathway and the biochemical significance of glucose-alanine cycle. (10%).
 2. Briefly describe the functions served by the polysaccharides in the biological system. (10%)
 3. What are the chemical and physical properties of aromatic amino acids? What functions do they serve other than being incorporated into body proteins in humans? (10%)
 4. Explain the major classification of protein enzymes and the major functions of each class defined by the Enzyme Commission of the International Union of Biochemistry and Molecular Biology (IUBMB). (10%)

- II. Comprehensive assay questions: (60%; 4 questions, 15% each)
 1. Considering the processes of biosynthesis and assembly of collagen starting from endoplasmic reticulum to extracellular region, explain the characteristics of primary, secondary, tertiary and quaternary structure of collagen, and the biochemical reactions involved in the post-translational processing of collagen. (15%)
 2. Explain the homeostatic regulation of blood glucose level and the biochemical reactions of fuel metabolism in **skeletal muscle** and **heart** when a person is in the following status: (1) 2 hours after eating a huge meal, (2) starved for 30 hours. (15%)
 3. Briefly diagram the process of cholesterol biosynthesis showing the key compounds and enzymes. Explain (1) how the cholesterol biosynthesis could be regulated in healthy human, and (2) how some statins (such as Mevacor, Zocor, Lipitor) work in depressing cholesterol biosynthesis. (15%)
 4. Briefly describe the *de novo* biosynthesis of purine nucleotides showing (1) what low-molecular-weight precursors are involved, and (2) how the purine *de novo* biosynthesis is regulated. (15%)

※ 注意：1. 考生須在「彌封答案卷」上作答。

2. 本試題紙空白部份可當稿紙使用。

3. 考生於作答時可否使用計算機、法典、字典或其他資料或工具，以簡章之規定為準。