

國立成功大學  
110學年度碩士班招生考試試題

編 號：332

系 所：臨床醫學研究所

科 目：生物化學

日 期：0203

節 次：第 3 節

備 註：不可使用計算機

※ 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。

(一) 選擇題 (共 70 分, 每題 5 分)

1. Which of the following metabolic processes occurs in the mitochondria?

- (A) Fatty acid synthesis
- (B) Cholesterol synthesis
- (C) Pentose phosphate pathway
- (D) Glycolysis
- (E) Fatty acid  $\beta$ -oxidation

2. The carbohydrate moiety always gets attached through which of the following amino acids in glycoproteins?

- (A) Glycine or alanine
- (B) Aspartate or glutamate
- (C) Glutamine or arginine
- (D) Asparagine, serin, or threonine
- (E) Tryptophan or phenylalanine

3. Glucagon stimulates release of fatty acids from adipocytes because it

- (A) activates lipoprotein lipase
- (B) activates hormone-sensitive lipase
- (C) activates a transporter of fatty acids
- (D) inhibits uptake of glucose
- (E) inhibits export of glycerol

Questions 4 – 6 refer to the following amino acids. Choose the answer for each question.

- (A) Proline
- (B) Tyrosine
- (C) Histidine
- (D) Lysine
- (E) Isoleucine

4. The amino acid that would disrupt the ordered structure of a folded  $\alpha$ -helix.

5. The amino acid that is likely to locate within the interior of a folded protein suspended in an aqueous buffer.

6. The amino acid that would contribute most to protein absorption at 280nm.

Questions 7 – 9 refer to the following. Choose the answer for each question.

- (A) Isomerization
- (B) Reduction
- (C) Group transfer
- (D) Oxidation
- (E) Hydrolysis

- 7. Phosphorylation of a serine residue on a protein.
- 8. Cleavage of a peptide bond.
- 9. Formation of a disulfide bond between cysteines.

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10. Substrate-level phosphorylation is catalyzed by which of the following enzyme?

- (A) Galactokinase
- (B) Glycerol kinase
- (C) Hexokinase
- (D) Pyruvate kinase
- (E) Phosphofructokinase-1

11. Which of the following is the origin of the majority of the ATP used in the pathway of gluconeogenesis?

- (A)  $\beta$ -oxidation of fatty acids
- (B) Oxidation of fructose-6-phosphate
- (C) Degradation of glycogen
- (D) Fructose-2,6-bisphosphate
- (E) Breakdown of amino acids

12. The statement of "The interaction between a protein and a nucleic acid in a particular complex is hydrophobic" can be evidenced by dissociating the complex with which of the following?

- (A) organic solvents
- (B) high salt
- (C) high pH
- (D) treatment with a nuclease
- (E) treatment with a protease

13. The migration of a protein on an SDS polyacrylamide gel is best described as proportional to the

- (A) negative charge
- (B) isoelectric point
- (C) log of the carbohydrate content
- (D) log of molecular weight
- (E) native volume

14. All of the following are possible fates of fatty acids that enter the liver EXCEPT (5%)

- (A) conversion to ketone bodies
- (B) conversion to glucose
- (C) conversion to triacylglycerols
- (D) conversion to acetyl-CoA for cholesterol synthesis
- (E) use by the liver as energy source

(二) 簡答題 (共 30 分, 每題 6 分)

Briefly describe what you know about the following terms.

1. Reactive oxygen species
2. Abasic sites in DNA
3. Polymerase chain reaction
4. Cyclic adenosine monophosphate
5. Allosteric regulation of enzymes