

義守大學 100 學年度碩士班入學招生考試試題

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| 系所別 | 生物技術與化學工程研究所、生物科技學系 | 考試日期 | 100/3/12 |
| 考試科目 | 生物化學 | 頁碼/總頁數 | 1/4 |

※此為試題卷，請將答案填寫在答案卷內，未寫於答案卷內者，不予計分。

※本科目不可使用計算機。

一、單選題（每題 4 分，共 60 分）

- Complete the sentence: _____ are building blocks for proteins; whereas _____ play roles in nutrition, cell structure and molecular recognition.
 - amino acids; lipids
 - lipids, amino acids
 - amino acids, carbohydrates
 - amino acids, vitamins
 - lipids, carbohydrates
- What are the major polymeric classes of macromolecules found in cells?
 - nucleic acids, proteins and polysaccharides
 - nucleic acids, lipids and polysaccharides
 - nucleic acids, proteins and lipids
 - nucleic acids, proteins, lipids and polysaccharides
 - lipids, proteins and polysaccharides
- Hydrogen bonding is observed in which of the following complexes?
 - DNA base-pair formation
 - between polypeptide chains
 - in the binding of Na^+ to Cl^-
 - a and b
 - a, b and c
- Which of the following is not a type of secondary structure found in proteins?
 - β sheet
 - α helix
 - random coil
 - random turn
 - disulfide bond
- Protein sequence data cannot be used to:
 - determine mutations.

考生注意：試題須隨答案卷繳交

第 1/4 頁

背面有題

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- b) estimate three-dimensional structure.
 - c) determine the exact DNA sequence.
 - d) deduce about biological function.
 - e) obtain evolutionary data.
6. The protein ____ contains a structure with extended helical chains coiled into a triple helix, and the sequence contains stretches of repetitive amino acid sequences.
- a) hemoglobin
 - b) collagen
 - c) triose phosphate isomerase
 - d) nuclease
 - e) none of the above
7. Three dimensional protein structure can be determined by the technique(s):
- a) X- ray diffraction
 - b) Nuclear magnetic resonance spectroscopy
 - c) SDS-polyacrylamide gel electrophoresis
 - d) a and b
 - e) a, b and c
8. The Y-axis and the X- axis on a Lineweaver-Burk Plot correlate to:
- a) $1/V_{\max}$; $1/[S]$
 - b) $1/V_o$; $1/[S]$
 - c) $1/K_M$; $1/[S]$
 - d) $1/V_o$; $[S]$
 - e) none of the above
9. Catalytic mechanisms include:
- a) acid-base catalysis
 - b) covalent catalysis
 - c) metal ion catalysis
 - d) a and c
 - e) a, b and c

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10. The disaccharide sucrose is composed of:

- a) glucose and fructose
- b) glucose and galactose
- b) galactose and maltose
- d) all of the above
- e) none of the above

11. Functions of the carbohydrates on glycoproteins include:

- a) cell surface identification markers.
- b) viral growth.
- c) protein turnover.
- d) a and c
- e) a, b and c

12. The model that best depicts a cell's bilayer plasma membrane is the:

- a) fluid mosaic model.
- b) vesicle model.
- c) micelle model.
- d) patch clamp model.
- e) none of the above

13. Which the following is NOT a difference between RNA and DNA?

- a) RNA contains ribose instead of 2-deoxyribose
- b) RNA contains uracil instead of thymine
- c) RNA can not form any base-paired structures
- d) RNA is less stable than DNA
- e) none of the above

14. Eukaryotic mRNA molecules are processed and modified prior to transport out of the nucleus.

Modification includes:

- a) capping.
- b) Poly A addition.

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- c) splicing to remove introns.
- d) all of the above
- e) none of the above

15. What are the three primary metabolic fates of pyruvate?

- a) ethanol, acetyl-CoA, glucose
- b) ethanol, acetyl-CoA, lactate
- c) acetyl-CoA, lactate, fructose
- d) ethanol, creatine, glucose
- e) none of the above

二、簡答題（每題 10 分，共 40 分）

1. Describe the function of a virus.
2. What types of the major biomolecules are found in cell membranes and walls?
3. Why would the Henderson-Hasselbalch equation be useful for making buffers in the laboratory? What is the equation?
4. What is multidrug resistance? How does this impact therapy?