

元智大學 103 學年度研究所 碩士班 招生試題卷

系(所)別： 生物科技與工程
研究所碩士班

組別： 不分組

科目： 生物化學(含分子生物
學)

用紙第 1 頁共 2 頁

⊗不可使用電子計算機

I. Please choose the most appropriate answer (total 20%, 2% each).

- Which property of proteins is utilized in gel filtration purification
(A) net charge (B) size
(C) hydrophilic or hydrophobic nature (D) UV absorption
- Which of the following component does not present in the cell membrane?
(A) nucleic acid (B) protein (C) lipid (D) carbohydrate
- Amino acids are joined together by an amide linkage called a
(A) protein bond (B) disulfide bond
(C) acrylated bond (D) peptide bond
- The solution of a strong acid will have a :
(A) low pH and low concentration of H^+
(B) high concentration of OH^-
(C) high pH and low concentration of H^+
(D) low pH and high concentration of H^+
- Please fill the terms in the following blanks, respectively. Reverse transcriptase is capable of catalyzing the synthesis of _____ using _____ as the template.
(A) DNA, DNA (B) RNA, DNA (C) RNA, RNA (D) DNA, RNA
- To prepare a 10% sucrose solution, one should
(A) add 10 g of sucrose into 100 ml of pure water
(B) add 5 g of sucrose into 50 ml of pure water
(C) add 100 ml of pure water into 10g of sucrose
(D) dissolve 5 g of sucrose in 35 ml of pure water, and bring the final volume to 50 ml with pure water.
- Which amino acid can form the disulfide bond?
(A) Gly (B) Val (C) Cys (D) Lys (E) Arg

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8. What is the storage polysaccharide in the animal cells is ?
(A) glycogen (B) starch (C) lipid (D) cellulose
9. From the β -oxidation of the fatty acid myristate (14:0), how many molecules of acetyl- CoA are produced?
(A)3 (B)7 (C)14 (D)21
10. Each of the following subcellular structures contains DNA EXCEPT
(A) the nucleus (B) ribosomes (C) chloroplasts (D) mitochondria

II. Define and give the description of the following terms (total 40%, 4% each).

1. PCR (polymerase chain reaction)
2. ATP (Adenosine triphosphate)
3. "Southern blot" and "Western blot"
4. Protein denaturation
5. "Genome" and "Proteome"
6. pH
7. Glycosylation
8. Photosynthesis
9. Glycolysis
10. Enzyme

III. Answer the following question (total 40%)

1. Briefly describe the structure and biological roles of cytoplasmic membrane.(10%)
2. What are nucleic acids and their functions in cells? (15%)
3. Please describe protein biosynthesis in eukaryotic cells. (15%)

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