

亞洲大學

97 學年度轉學招生考試試題紙

學系別	考試科目	考試日期	時 間	備註
保健營養生技學系大學日三年級 生物科技學系大學日三年級	024 生物化學(A)	97.07.27	10:40-12:20	共 5 頁

20 Single-Choice Questions (4 points each)

- The following statements are wrong regarding irreversible enzyme inhibitors. (4 points)
 - Do not alter K_m .
 - Decrease the concentration of active enzyme in a system.
 - Form covalent bonds with the enzyme or enzyme-substrate complex.
 - Do not alter V_{max} .
 - Are exemplified by cyanide and cytochrome oxidase.
- The following statements are wrong regarding double-stranded DNA. (4 points)
 - Purine bases pair with pyrimidine bases.
 - There are always equal amounts of guanine and cytosine nucleotides.
 - Hydrogen bonds are the major forces that maintain a double helix structure.
 - Phosphodiester bonds link adjacent nucleotides.
 - Uracil base pairs with adenine.
- Which amino acid has an R-group which contains only C and H? (4 points)
 - Isoleucine.
 - Histidine.
 - Serine.
 - Tyrosine.
 - Glutamic acid.
- The following bond forces are important in quarternary structure. (4 points)
 - Hydrogen bonds.
 - Hydrophobic bonds.
 - Disulfide bonds.
 - Both hydrogen bonds and hydrophobic attraction.
 - All of these are important in quarternary structure.
- Which of the following is the best phrase to describe the modern view of membrane structure? (4 points)
 - Membranes are lipid-lipid bilayers.
 - Membranes are lipid-lipid bilayers with associated proteins.
 - Membranes are composed solely of lipids and proteins.
 - Membranes are a fluid mosaic of lipids and proteins.
 - Membranes are found only in eukaryotic cells.

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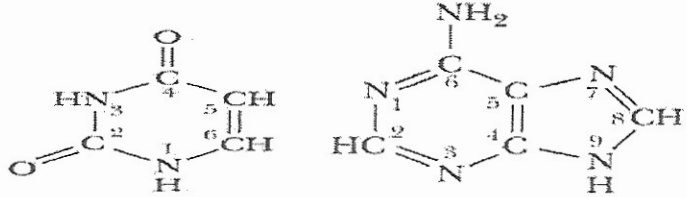
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6. The sugar called sucrose contains the following simple sugars? (4 points)
 - a. Galactose.
 - b. Glucose.
 - c. Fructose.
 - d. Both Galactose and Glucose.
 - e. Both Glucose and Fructose.
7. The $\text{Na}^+\text{-K}^+$ pump is an active transport system that (4 points)
 - a. Pumps sodium ions out of the cell and potassium ions into the cell.
 - b. Pumps sodium ions into the cell and potassium ions out of the cell.
 - c. Provides energy such that sodium and potassium ions can move freely in either direction.
8. Light energy absorbed in chloroplasts is used in the light phase for all of these reactions, except: (4 points)
 - a. To reduce water.
 - b. To make ATP.
 - c. To generate NADPH.
 - d. To generate oxygen.
 - e. All of these occur during the light phase.
9. After the reaction with Rubisco, the major difference between the Calvin cycle and gluconeogenesis in liver is the following reaction. (4 points)
 - a. The reaction of 1,3 bisphosphoglyceric acid uses NADPH instead of NADH.
 - b. The formation of 1,3 bisphosphoglyceric acid from 3-phosphoglyceric acid uses GTP instead of ATP.
 - c. The reaction of 1,3 bisphosphoglyceric acid uses NADH instead of NADPH.
 - d. Phosphatases are not required in plants.
 - e. More than one of these reactions is substantially different in plants compared to liver.
10. Which of the following advantages of the Polymerase Chain Reaction is true : (4 points)
 - a. The reaction is specific for certain sequences in the DNA.
 - b. Only small amounts of template are needed.
 - c. Results can be obtained with DNA that is old or partially degraded.
 - d. All of products from a specific part of the DNA will be the same size.
 - e. All of these are advantages of PCR.

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11. What kind of bases in the following structure? (4 points)

- a. Thymine and Adenine.
- b. Uracil and Guanine.
- c. Uracil and Adenine.
- d. Thymine and Guanine.
- e. None of the above.



12. The Nobel prize winner who proposed the “Thermodynamic hypothesis of protein folding” based on the study of ribonuclease A. (4 points)

- a. C. Anfinsen
- b. L. Pauling
- c. F. Sanger
- d. F. Crick
- e. A. Tiselius

13. Which one of the following class of molecules has the most varieties to carry out its biological function? (4 points)

- a. DNA.
- b. RNA.
- c. Protein.
- d. Carbohydrates.
- e. Lipids.

14. What is the approximate PI of arginine with three pKa of 2.2, 9.0 and 12.5? (4 points)

- a. 2.2
- b. 5.6
- c. 9.0
- d. 10.8
- e. 12.5

15. Most of the ATP in the cell exists in what ionic form? (4 points)

- a. Negative charge of 1.
- b. Negative charge of 2.
- c. Negative charge of 3.
- d. Negative charge of 4.
- e. None of the above.

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16. Which of the following deoxyoligonucleotides will hybridize with a DNA containing the sequence (5')CTCAATGAG(3')? (4 points)
- (5')CTCATTGAG(3')
 - (5')GAGTAACTC(3')
 - (5')GAGTCAACT(3')
 - (5')TCTGACCAG(3')
 - (5')CTCAATGAG(3')
17. Hemoglobin is an example of a(n): (4 points)
- Enzyme.
 - Regulatory protein.
 - Transport protein.
 - Storage protein.
 - Structure protein.
18. α -Helix and β -sheet are components of _____ structure. (4 points)
- Primary.
 - Secondary.
 - Tertiary.
 - Quaternary.
 - All are true.
19. Reaction of the peptide, ala-met-lys-ser, with PITC at pH 8.0 followed by mild acidification (first cycle of Edman method) would release: (4 points)
- The labeled peptide ala-met-lys-ser-PTH.
 - PTH-ala, PTH-met, PTH-lys and PTH-ser.
 - PTH-ser and the peptide ala-met-lys.
 - PTH-ala and met-lys-ser.
 - All of the above.
20. DNA replication occurs at _____ for eukaryotes.
- G1 phase.
 - G2 phase.
 - S phase.
 - M phase.

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Question:

21. What is the "Central Dogma" proposed by Francis Crick in 1950's regarding informational macromolecules present in various cells and how is it modified today? (6 points)
22. What is "Polymerase Chain Reaction" and how is it applied to biotechnology? What is the name of enzyme used in the PCR reaction and the aim of PCR program? (7 points)
23. There is a new emerging field of "Proteomic" in contrast to the conventional Human "Genomic" study. What are the major differences between the two in terms of the methodology? (7 points)