

東吳大學 102 學年度碩士班研究生招生考試試題

第 1 頁，共 3 頁

系級	微生物學系碩士班 B、C 組	考試時間	100 分鐘
科目	生物化學	本科總分	100 分

Choose the correct answer from the list below. Not all of the answers will be used.

※請標明題號後作答於答案卷上，請勿於本試題上作答，否則不予計分。

I. Use the following to answer questions 1-10: (20%)

a) uridine	b) true	c) G	d) thymine	e) H	f) ugar-phosphate units	
g) covalent	h) Archaea	i) entropy	j) system	k) 3	l) 2	m) false

- DNA is made from the building blocks adenine, guanine, cytosine, and _____.
- The DNA backbone is made from repeating _____.
- _____ The number of hydrogen bonds formed between A and T.
- _____ The number of hydrogen bonds formed between G and C.
- The fundamental groups of organisms include Eukarya, Bacteria, and _____.
- _____ The strongest bonds in molecules:
- _____ Hydrogen bonds are usually weaker than covalent bonds (true/false).
- _____ Matter within a defined region of space.
- _____ For spontaneous reactions the ΔG must be positive (true/false).
- _____ Gibbs-free energy.

II. Use the following to answer questions 11-20: (20%)

a) L-amino acids	b) water	c) protons	d) Zwitterions
e) secondary structure	f) tertiary structure	g) Ramachandran	h) cysteine
i) extracellular	j) histidine	k) proline	l) Sanger
m) D-amino acids			

- _____ Chiral type of amino acids found in proteins.
- _____ Another name for dipolar molecules.
- _____ Disulfide bonds are formed by pairs of which amino acid?
- _____ The amino acid with a pKa near neutral pH.
- _____ When a peptide bond is formed, what molecule is also made?
- _____ Where are proteins with extensive disulfide links likely to be found?
- _____ This amino acid residue frequently found in β -turns.
- _____ Name of the plot that allows one to investigate the likely orientation of certain amino acid pairs.
- _____ The type of structure to which α helices, β sheets, and turns are referred.
- _____ The overall three-dimensional structure of a protein is referred to as

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III. Use the following to answer questions 21-30: (20%)

a) annealing	b) mRNA molecules	c) synonyms	d) introns
e) amino acid	f) Tm	g) retroviruses	h) exon
i) Erwin Chargaff	j) release factors	k) gene expression	l) Rosalyn Franklin

21. _____ The information-carrying intermediates of transcription.
22. The flow of genetic information from DNA to protein is called _____.
23. _____ Scientist who noted the A:T and G:C ratios in DNA are approximately 1:1.
24. The temperature at which half the DNA helical character is lost is referred to as _____.
25. DNA renaturation after melting is called _____.
26. Noncoding regions within a gene are known as _____.
27. _____ Organisms in which the flow of genetic information can be RNA to DNA.
28. Codons that specify the same amino acids are termed _____.
29. A three-base codon defines a specific _____.
30. Stop codons are read by _____.

IV. Use the following to answer questions 31-40: (20%)

a) apoenzymes	b) Circe	c) active site	d) Cleland
e) spontaneous	f) turnover number	g) induced fit	h) prosthetic group
i) bi-bi	j) substrates	k) energy	l) allosteric

31. _____ The site on the enzyme where the reaction occurs.
32. _____ The substance that the enzyme binds and converts to product.
33. Enzymes that do not have the required cofactor bound are called _____.
34. A tightly bound cofactor might be called a _____.
35. A reaction that is exergonic will be _____.
36. An endergonic reaction requires an input of _____ to proceed.
37. The k_{cat} is often referred to as the _____.
38. Using attractive forces to lure a substrate into an enzyme site is called the _____ effect.
39. _____ Enzymes that display sigmoid plots instead of hyperbolic plots predicted by Michaelis-Menten kinetics.
40. _____ The dynamic recognition of the substrate in binding to the enzyme.

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V. Use the following to answer Questions 41–50: (20%)

a) O ₂	b) niacin	c) phototrophs	d) ATP
e) CO ₂	f) coenzyme A	g) vitamin	h) amphibolic
i) ADP	j) NADPH	k) chemotrophs	l) FAD

41. _____ These organisms use energy from sunlight and convert it to chemical energy.
42. _____ These organisms obtain chemical energy from oxidation of foodstuffs.
43. _____ Pathways that can be either anabolic or catabolic depending on the energy conditions of the cell.
44. _____ In aerobic organisms, this is the ultimate acceptor of electrons.
45. _____ In aerobic metabolism, this is the product of oxidation of carbon containing fuels.
46. _____ This vitamin is the electron carrier, NADH.
47. _____ This substance is the electron donor in most reductive biosyntheses.
48. _____ This compound serves as an acyl carrier in metabolism.
49. _____ This is the “chemical currency” of metabolism.
50. _____ These small organic compounds are required in the diet of higher organisms and are components of coenzymes.