

選擇題: 30% (請標示題號，否則不予計分/ 每題各佔 5%)

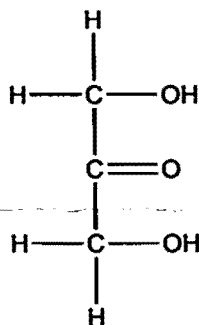
1. The macromolecules that serve in the storage and transmission of genetic information are:

- A. carbohydrates
- B. lipids
- C. membranes
- D. nucleic acids
- E. proteins

2. Amino acid residues commonly found in the middle of turn are:

- A. Ala and Gly
- B. hydrophobic
- C. Pro and Gly
- D. those with ionized R-groups
- E. two Cys

3. The following molecule is a(n):



- A. Aldose
- B. Ketose
- C. Amino acid
- D. Fatty acid
- E. Nucleotide

4. An enzyme known to follow (遵循) Michaelis-Menten kinetics:

V_0 (mol/min)	Substrate added (mmol/L)
217	0.8
325	2
433	4
488	6
647	1,000

The K_m for this enzyme is:

- A. 1 mM.
- B. 1,000 mM.
- C. 2 mM.
- D. 4 mM.
- E. 6 mM.

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5. Chargaff's rules state that in typical DNA:

- A. $A = G$.
- B. $A = C$.
- C. $A = U$.
- D. $A + T = G + C$.
- E. $A + G = T + C$.

6. When an acid (HA) at $\text{pH} = 6.0$: concentration of $\text{HA} = 0.03$; concentration of $\text{A}^- = 0.3$. What is the pK_a value for HA?

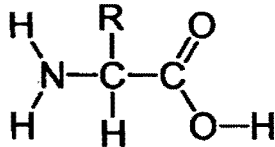
- A. 4
- B. 5
- C. 6
- D. 7
- E. 8

問答題70% (請標示題號，否則不予計分)

7. 化學反應的自由能 ΔG 變化是一個非常重要的指標，依下列所形容自由能 ΔG 的變化，敘述化學反應的自發性和能量釋放的狀況：

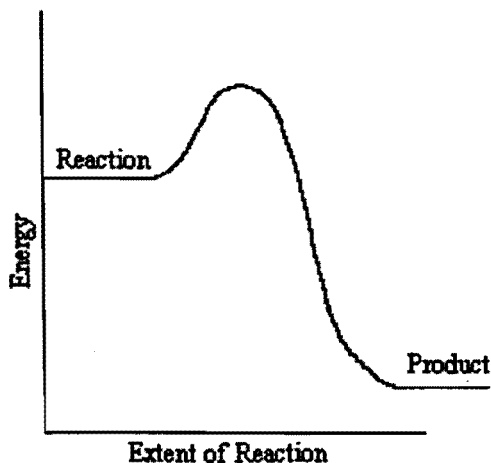
- a) 如果化學反應 $\Delta G < 0$ (10%)
- b) 如果化學反應 $\Delta G > 0$ (10%)
- c) 如果化學反應是 $\Delta G = 0$ (5%)

8. 圖中的分子英文名稱為何？(5%)，其分子組成生物四大分子中的那一類？(10%)



9. 何謂 anomeric carbon? (10%)

10. 以下列的化學反應圖示為例，在答案卷中繪出此圖，並標識出反應的活化能(activation energy)及自由能(free energy) (20%)



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