

國立嘉義大學 104 學年度

應用化學系碩士班（乙組）招生考試試題

科目：生物化學

一、選擇題 40 分（每題 4 分）

1. Usually ATP is converted from ADP. Where is ATP synthesized in mammalian cells?
(A) peroxisomes
(B) mitochondria
(C) cytosols
(D) endoplasmic reticulum
(E) nucleus
2. Watson and Crick proposed the B-form double helix model for DNA structure. What is the best nucleotide to be complementary to cytidine, C ?
(A) guanosine, G (B) thymidine, T (C) uridine, U (D) cytidine, C (E) adenosine, A
3. Which of the following coenzymes is reduced-form that carries two more electrons than its oxidized-form counterpart?
(A) FAD (B) FMN (C) NADP⁺ (D) NADH (E) GDP
4. Which of the following amino acids contain an aromatic residue?
(A) tryptophan (B) serine (C) proline (D) Lysine (E) methionine
5. In general, a newly synthesized messenger RNA, called primary RNA or pre-mRNA, contains introns and exons. What is the process in which the introns are removed and the exons are joined to form a matured mRNA?
(A) signal transduction
(B) translocation
(C) transcription
(D) translation
(E) splicing
6. In aerobic organism, fatty acids are ultimately oxidized to CO₂ and H₂O via TCA cycle (Krebs cycle or citric acid cycle). What compound will fatty acids be degraded into before entering the TCA cycle?
(A) acetyl-CoA (B) pyruvate (C) GTP (D) glycine (E) glucose

7. In study of enzyme kinetics, turnover number is defined as the number of substrate molecules converted to product in a given time on a single enzyme molecule when enzyme is saturated with substrate. Which of the following terms is equivalent to turnover number?
(A) K_{cat} (B) K_d (C) K_a (D) V_{max} (E) K_M
8. When one says a protein contain β -sheets structure, the β -sheets structure is one feature of
(A) primary structure
(B) secondary structure
(C) tertiary structure
(D) quaternary structure
(E) none of the above.
9. Which of the following compounds is monosaccharide
(A) glucose (B) sucrose (C) amylase (D) cellulose (E) starch
10. Which of the following can associate with G-protein?
(A) cortisol (B) glucose (C) cholesterol (D) GTP (E) ascorbic acid.

二、問答題 60 分（每題 15 分）

1. Please write the name of twenty amino acids.
2. Clearly describe what the hydrogen bond is.
3. The process of initiation step for protein translation in prokaryotic and eukaryotic cells is similar but somewhat differently. Explain how ribosomes bind to mRNA and reach to the start codon in prokaryotic and eukaryotic cells, respectively.
4. Explaining the following terms:
(A) feedback inhibition
(B) the dark reaction (in photosynthesis)
(C) glycolysis