

所別：生命科學系碩士班 醫藥與環境生物科技組(一般生) 科目：生化與分生
(學位在職生)

一. 單選題(每題 4 分; 共 7 題) (Total 28%):

1. A water-soluble globular protein is most likely to have the highest proportion of which of the following amino acid residues buried within its core?
(A) Cysteine
(B) Histidine
(C) Isoleucine
(D) Aspartic acid
(E) Arginine
2. During glycolysis, each molecule of glucose is converted into
(A) 2 molecules of fructose 1,6 bisphosphate
(B) 2 molecules of pyruvate
(C) 4 molecules of NADH
(D) 4 molecules of ATP
3. Proteins responsible for oxidative phosphorylation locate in which part of mitochondria
(A) Outer membrane
(B) Inner membrane
(C) Intermembrane space
(D) Matrix
(E) All above
4. Glycolysis and the citric acid cycle provide the precursors needed to synthesize many important biological molecules. Which of the following is NOT TRUE?
(A) Oxaloacetate for synthesis of purines
(B) Citrate for synthesis of cholesterol
(C) Succinyl CoA for synthesis of heme
(D) Fructose-6-phosphate for synthesis of nucleotides
(E) α -ketoglutarate for synthesis of glutamate
5. Which of following is NOT TRUE?
(A) Fuel store in brain is glycogen
(B) Fuel store in liver is glycogen
(C) Fuel store in skeletal muscle is glycogen
(D) Fuel store in liver is triacylglycerols
(E) Fuel store in adipose tissue is triacylglycerols
6. Which enzyme is required to produce urea from arginine?
(A) Transaminase
(B) Arginine dehydrogenase
(C) Arginase
(D) Argininosuccinase
(E) Arginine synthetase

注意：背面有試題

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7. If a reaction $A \rightarrow B$ is energetically favorable reaction, how can the energetically unfavorable reaction $B \rightarrow A$ occur in a cell?
- (A) Couple a reaction with $\Delta G=0$
 - (B) Couple a reaction with $\Delta G^\circ > 0$
 - (C) Couple a reaction with $\Delta G > 0$
 - (D) Couple a reaction with $\Delta G^\circ < 0$
 - (E) Couple a reaction with $\Delta G < 0$

二. 解釋名詞(每題 3 分; 共 10 題) (Total 30%)

1. Shine-Dalgarno (SD) sequence
2. IRES
3. Topoisomerase
4. Helicase
5. cDNA
6. Transposon
7. Intron
8. Regulon
9. PCR
10. Electroporation

三. 問答題 (共 8 題) (Total 42%)

1. What is β -oxidation and why is so called? (5%)
2. What is the common energy carrier in a cell and what are electron carriers in a cell? (5%)
3. After prolonged exertion, skeletal muscle accumulates lactate. This is a significant factor limiting athletic performance. How is lactate produced in muscle converted to glucose? (6%)
4. What are differences between de novo and salvage pathways and their importance? (6%)
5. Draw the general structure of a deoxynucleoside monophosphate. (3%)
6. What are three characteristics that a vector typically have, and briefly explain why? (6%)
7. Describe two methods by which, in *E. coli*, gene transcription is terminated. (6%)
8. What are different initiation of transcription ways between eukaryote and prokaryote? (5%)