

亞洲大學

100 學年度碩士班入學招生考試試題紙

學系別	考試科目	考試日期	時 間
保健營養生技學系碩士班 生物科技學系碩士班	生物化學 (A)	100.04.16	10:40-12:20

一、單選題 (每題3分，共75分)

1. What charged group(s) are present in glycine at a pH of 7?
(A) $-\text{NH}_3^+$ (B) $-\text{COO}^-$ (C) $-\text{NH}_2^+$ (D) a and b (E) a, b, and c
2. The configuration of most α -carbon atoms of amino acids linked in a peptide bond is
(A) cis. (B) circular. (C) parallel. (D) trans. (E) perpendicular.
3. Which of the following amino acid residues would most likely be buried in the interior of a water soluble, globular protein?
(A) Asp (B) Ser (C) Phe (D) Lys (E) Gln
4. Which amino acids in chymotrypsin are found in the active site and are participants in substrate cleavage?
(A) his, ser, asp (B) his, ser (C) asp, lys (D) lys, arg (E) his, ser, arg
5. Many allosteric enzymes have two types of subunits, termed
(A) catalytic and regulatory. (B) regulatory and allosteric. (C) allosteric and regulatory. (D) All of the above. (E) None of the above.
6. Which of the following is an example of a zymogen?
(A) pepsinogen (B) procarboxypeptidase (C) T-form of ACTase
(D) All of the above. (E) a and b
7. The simplest carbohydrates are
(A) D- and L-glyceraldehyde. (B) dihydroxyacetone and D- and L-glyceraldehyde. (C) dihydroxyacetone and glycerate.
(D) All of the above. (E) None of the above.

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8. What two 3-carbon molecules are generated by the cleavage of fructose-1,6-bisphosphate?
(A) glyceraldehyde-3-phosphate and 3-phosphoglycerate
(B) glyceraldehyde-3-phosphate and dihydroxyacetone phosphate
(C) pyruvate and phosphoenolpyruvate (D) enolase and 2-phosphoglycerate (E) glyceraldehyde-3-phosphate and pyruvate

9. How many high-energy phosphate bonds are expended in gluconeogenesis?
(A) three (B) six (C) two (D) four (E) one

10. In which step of the citric acid cycle is $FADH_2$ formed?
(A) the conversion of succinate to malate (B) the conversion of succinate to oxaloacetate (C) the conversion of succinate to fumarate (D) the conversion of malate to oxaloacetate (E) none of the above

11. ATP is called the energy currency. The currency of reducing power is
(A) NADPH. (B) NADH. (C) AMP. (D) ADP. (E) none of the above.

12. The purpose of the pentose phosphate pathway is to
(A) generate ATP. (B) generate NADPH. (C) synthesize 5-carbon sugars (D) a and b. (E) b and c.

13. The key enzyme in glycogen degradation is
(A) glycogen phosphatase. (B) glycogen phosphorylase (C) glucose 1-phosphate synthase. (D) all of the above. (E) none of the above.

14. Two critical hormones that signal for glycogen breakdown are
(A) insulin and epinephrine. (B) glucagon and epinephrine.
(C) glucagon and insulin (D) all of the above. (E) none of the above.

15. RNA modification in prokaryotes includes the following:
(A) cleavage and modification of nascent RNA. (B) addition of

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<p>nucleotides. (C) spliceosome-mediated splicing of the nascent RNA. (D) a and b. (E) a, b, and c.</p> <p>16. In preparation for attachment to the tRNA, amino acids are activated by (A) methylation. (B) adenylation. (C) dimethylation. (D) all of the above. (E) none of the above.</p> <p>17. What is the first step in gene expression control? (A) control of translation (B) control of mRNA processing (C) control of transcription (D) control of replication (E) None of the above.</p> <p>18. A chemical commonly used to induce the lac operon in laboratory experiments is (A) lactose. (B) X-Gal. (C) IPTG. (D) all of the above. (E) none of the above.</p> <p>19. Protein synthesis takes place on (A) lysosomes. (B) nuclear pores. (C) vacuoles. (D) ribosomes (E) none of the above.</p> <p>20. Eukaryotic and prokaryotic translation differ primarily in the _____ step. (A) initiation (B) elongation (C) termination (D) all of the above (E) none of the above</p> <p>21. The source(s) of NH₂ groups in synthesis of nucleotides: (A) aspartate (B) glutamine (C) glycine (D) a and b (E) a, b, and c</p> <p>22. TMP is made from (A) dTMP. (B) UTP. (C) CTP. (D) ATP. (E) none of the above.</p>			

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23. In the urea cycle, the second nitrogen of urea enters the cycle in the form of which of the following metabolites?

(A) alanine (B) glutamine (C) ornithine (D) aspartate (E) arginine

24. Coenzyme(s) involved in the degradation of saturated fatty acyl CoA include(s)

(A) FAD. (B) NAD^+ . (C) TPP. (D) a and b. (E) a, b, and c.

25. How many rounds of β oxidation would be required for a 16-C fatty acyl chain to be degraded to acetyl-CoA?

(A) 16 (B) 8 (C) 7 (D) 15 (E) None of the above.

二、問答題 (共 25 分)

1. 利用 Michaelis-Menten equation 的倒數稱為 Lineweaver-Burk

double-reciprocal plot。試繪圖說明斜率、y-截距、x-截距在圖中的位置，

並說明如何獲得 K_m 及 V_{max} 。(15 分)

2. Bohr effect 對紅血球蛋白的影響為何？(10 分)