

考生注意：1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分，並限以藍黑色筆作答。
3. 試題隨卷繳回。(餘詳詳閱試場規則)

I. 是非題 (每題 2 分，共 16 分)：

1. Some enzymes require metallic cations to achieve full catalytic activity.
2. When blood glucose is abnormally low, the pancreas releases insulin
3. Bacterial mRNA can be translated while it is still being synthesized.
4. RNA does have a double strand form.
5. Eukaryotic mRNAs are generally synthesized by RNA polymerase I.
6. Topoisomerases cut one or both coiled DNA strands, wind the ends by rotation and then rejoin the cut ends.
7. Margarine made from plant oils are healthier, since they are hydrogenated for preadability.
8. Restriction enzymes randomly cleave DNA.

II. 單選題，請選出一個最合適的答案 (每題 4 分，共 84 分)：

1. Antibodies are suitable for diagnostic tests because

(A) they can be made radioactive

(C) they are found in very small quantities

(E) they are found everywhere

(B) they can be readily purified

(D) they bind very specifically to antigens
2. Which of the following statements is FALSE?

(A) Enzymes make reactions 10 to 10^7 times faster.

(C) Enzymes speed up the attainment of a reaction equilibrium.

(E) Enzymes lower the amount of energy needed for a reaction.

(B) Enzymes are unchanged during a reaction.

(D) Most enzymes are proteins.
3. Intracellular buffers include

(A) proteins

(D) hemoglobin

(B) inorganic phosphorus

(E) a, b and c

(C) both a and b
4. What is the N-terminal residue for the pentapeptide Val-Ile-Glu-Arg-Tyr?

(A) Arginine

(B) Isoleucine

(C) Tyrosine

(D) Tryptophan

(E) Valine
5. Supersecondary structures that contain recognizable combinations of α -helices, β -strands and loops (e.g. the Greek Key) are called _____.

(A) motifs

(B) folds

(C) homologous regions

(D) domains
6. _____ is used to estimate the molecular weight of oligomeric proteins, while _____ is used to determine molecular weight of each chain.

(A) Melting point; electrophoresis

(C) Acrylamide gel electrophoresis; gel electrophoresis

(E) SDS-gel electrophoresis; SDS-gel electrophoresis

(B) SDS-gel electrophoresis; gel-filtration chromatography

(D) Gel chromatography; SDS-gel electrophoresis
7. Cooperative binding of oxygen by hemoglobin

(A) is induced by hemoglobin

(C) is induced by oxygenation

(B) is a result of different affinities for oxygen by each subunit protein

(D) is a result of interaction with myoglobin

國立暨南國際大學九十三年度碩士班研究生入學考試試題

第 1 節生物化學 適用：(應化所 445)

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(本試題共 3 頁，第 2 頁)

8. The force that drives an ion through a membrane channel depends upon:
(A) the size of the channel. (B) the size of the ion. (C) the size of the membrane.
(D) the charge on the membrane. (E) the difference in electrical potential across the membrane.
9. The roles of amino acid residues at the active site of enzymes can be determined by removing certain residues using the technique of
(A) specific hydrolysis (B) site mutagenesis (C) covalent binding
(D) acylation of specific residues (E) all of the above
10. An ion commonly found in metalloenzymes and which can undergo reversible oxidation and reduction is
(A) Ca^{2+} (B) Mg^{2+} (C) S^{2-} (D) Fe^{2+} (E) All of the above
11. In a typical eukaryotic plasma membrane:
(A) oligosaccharides face outward, not toward the cytosol (B) proteins can move in and out of the bilayer
(C) lipids can move and diffuse through the bilayer (D) some lipids can rotate within the bilayer
(E) all of the above
12. Starch and glycogen are both polymers of:
(A) sucrose. (B) fructose. (C) glucose-1-phosphate.
(D) α -D-glucose. (E) β -D-glucose.
13. In the mitochondria phosphate ion (PO_4^{3-}) and H^+ are transported together from the intermembrane space into the matrix. Which statement applies?
(A) The transport protein is a symport. (B) The interior of the transport protein must be uncharged.
(C) The transport protein must have a relatively large central channel to accommodate both ions.
(D) All of the above.
14. The glycolytic pathway oxidizes glucose to two molecules of pyruvate and also produces a net of two molecules of ATP. ATP allosterically inhibits the enzyme, PFK-1, that catalyzes the third step of glycolysis. This is an example of
(A) feed-forward activation (B) feedback inhibition
(C) negative cooperativity (D) competitive inhibition
15. Which step in the citric acid cycle is a rearrangement reaction?
(A) succinyl CoA to succinate (B) fumarate to L-malate
(C) citrate to isocitrate (D) glucose-6-phosphate to fructose-6-phosphate
16. The production of O_2 from water supplies an electron for
(A) Photosystem I (B) Photosystem II (C) Cytochrome c complex
(D) All of the above (E) a and b
17. Amino acids are attached to tRNA at the
(A) anticodon region (B) 5' end (C) 3' end (D) variable arm
18. A mouse embryo is transformed with recombinant DNA from a rat. The resulting mouse is a/an _____ organism.
(A) mosaic (B) composite (C) sterile (D) transgenic

國立暨南國際大學九十三年學年度碩士班研究生入學考試試題

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19. Which of the following is correct?

- (A) The template strand is copied from the 5' end to the 3' end
(B) Transcription proceeds in the 5' \rightarrow 3' direction
(C) RNA polymerization proceeds in the 3' to 5' direction
(D) None of the above

20. In a double-stranded nucleic acid, adenosine typically base-pairs with:

- (A) guanine, (B) uracil, (C) inosine, (D) cytosine, (E) thymine.

21. Even when a gene is available and its sequence of nucleotides is known, chemical studies of the protein are still required to determine:

- (A) the location of disulfide bonds.
(B) the number of amino acids in the protein.
(C) the amino-terminal amino acid.
(D) molecular weight of the protein.
(E) whether the protein has the amino acid methionine in its sequence.

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