

國立暨南國際大學九十二學年度博士班研究生入學考試試題

435 生物化學〈應化所適用〉

(本試題共 2 頁，第 1 頁)

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。
3. 試題隨卷繳回。

單選題：請選擇一個最合適的答案；每題 4 分，共 60 分。

1. The monomers that make up a starch molecule are:
I. optically active II. not optically active III. aldehydes IV. ketones
and the polymer itself is formed primarily by
V. addition VI. condensation
A) I, III, VI B) II, IV, V C) I, IV, VI
D) I, III, V E) II, IV, VI
2. What type of bonding occurs between two consecutive nucleotides in RNA?
A) hydrophobic B) ionic C) ester
D) amide E) hydrogen
3. Which of the following statements is correct?
A) No one has ever made a polymer using amide bonds.
B) The primary structure of proteins is determined by 3'-5'.
C) Nucleic acids are made of nucleotides joined together with amide bonds.
D) Fats are polymers composed of monomers called monosaccharides.
E) none of these
4. Which of the following is not true of the reaction catalyzed by ribonucleotide reductase?
A) It acts on nucleoside diphosphates.
B) Thioredoxin acts as an essential electron carrier.
C) Its mechanism involves formation of a free radical.
D) Glutathione is part of the path of electron transfer.
E) There is a separate enzyme for each nucleotide (ADP, CDP, GDP, UDP).
5. Table sugar is a disaccharide formed from
A) D-galactose and D-ribose B) beta-D-glucose and fructose C) alpha-D-glucose and fructose
D) D-galactose and fructose E) none of these
6. Which one of the following statements about the structure of proteins is incorrect?
A) Disulfide bonds provide strong intrachain interactions.
B) Nonpolar groups tend to face the outside of a protein in an aqueous solution.
C) Heat can disrupt tertiary structure.
D) Ionized amino acid side chains can form salt bridges within a protein.
E) Hydrogen bonding stabilizes the α -helix proteins.
7. Which of the following is a carbohydrate reservoir for animals?
A) glycogen B) cellulose C) two of these
D) starch E) none of these
8. Which of the following is found in nearly all organisms and is the starting material for the formation of vitamin D, steroid hormones, and bile acids?
A) triglycerides B) phospholipids C) cholesterol
D) fats E) fatty acids

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- 簡答題：共 40 分。

1. What would you expect to happen to levels of mevalonate in human plasma if an individual were to go from a meat-containing diet to a vegetarian diet? (6 %)
2. Briefly describe the biochemical roles of (a) primase (b) helicase (c) single-strand DNA-binding protein (SSB) in DNA replication. (12 %)
3. Indicate whether the following statements are true (T) or false (F). (16 %)
 - (a) A ribosome is the complex within which protein synthesis occurs.
 - (b) All tRNAs have the sequence — CCA at their 5' terminus.
 - (c) Eukaryotic RNA polymerases initiate transcription at specific sites on the DNA (promoters), but prokaryotic polymerases do not.
 - (d) There are four binding sites for aminoacyl-tRNAs on a ribosome.
4. Why must the DNA polymerase used in the polymerase chain reaction (PCR) be heat stable? (6 %)