

國立成功大學

112學年度碩士班招生考試試題

編 號：266

系 所：藥理學研究所

科 目：分子生物學

日 期：0207

節 次：第 3 節

備 註：不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

一、選擇題(單選)：每題 4 分，共 60 分

1. Restriction enzyme:

- (A) It only generates blunt-end after cleavage.
- (B) Cleave non-specific sequence
- (C) Cleave site can be protected by sequence-specific methylation.
- (D) Was first found in the mice.

2. What is/are the function of telomerase?

- (A) To separate parental strands
- (B) Usually add eight-nucleotide repeats
- (C) adding new nucleotides to the 3'-end DNA chain
- (D) it contains DNA as a template.

3. Which one of followings about mitochondria DNA (mDNA) is correct?

- (A) Contains their own DNA
- (B) The mDNA is linear
- (C) From both the parent.
- (D) Codes for all the proteins required to maintain mitochondria structure.

4. Each NADH produces

- (A) 3ATP
- (B) 2ATP
- (C) 5ATP
- (D) 1ATP

5. Which one of followings could be used to separate proteins by size?

- (A) Ion-exchange chromatography
- (B) Isoelectric focusing
- (C) SDS PAGE
- (D) Reverse-phase HPLC

6. Synthesis rate of DNA could be best examined by radiolabeled on which of following?

- (A) Guanine
- (B) Thymidine
- (C) ATP
- (D) Polymerase

7. In the physiological condition (pH=7), which of following amino acid has no charge?

- (A) Aspartate
- (B) Glutamate
- (C) Histidine
- (D) Glutamine

8. Which of the following acts with DNA sequences that are upstream of the start site of transcription?
- (A) RNA polymerase (B) Primase
(C) Helicase (D) none of above
9. Which one is correct about Ribozymes?
- (A) Catalytic function is in RNA subunit.
(B) Belongs to ribonucleoprotein particle
(C) Only functions in mRNA processing
(D) require protein cofactor to form peptide bond.
10. What happens in DNA region to cause mispaired DNA?
- (A) direct repeat (B) inverted repeat
(C) mirror repeat (D) All of them
11. DNA gyrase
- (A) occurs in both eukaryotes and prokaryotes
(B) increases linking number
(C) reseal nicks on both strands
(D) clear negative supercoils
12. What are needed to prepare recombinant DNA?
- (A) poly(dT) (B) DNA ligase
(C) cDNA (D) All of them
13. What is required to express eukaryotic gene in prokaryotes
- (A) absence of introns
(B) fusion protein
(C) regulatory element of gene
(D) All of them
14. Which one is incorrect about operons
- (A) are eukaryotic gene
(B) contain structural gene
(C) contain multiple promoters
(D) contain control sequences

15. Deoxyribonucleotides

- (A) must be supplied by diet
- (B) synthesized from ribonucleotides
- (C) cannot be synthesized from ribonucleotides
- (D) is formed only from free bases

二、問答題：40 分

1. Please list five major heterocyclic bases that are used for nucleic acids? (10%)
2. Please list and brief describe four different ways to detect mRNA (could be used to detect mRNA amount, time or localization). (10%)
- 3: What is the function of mRNA, rRNA and tRNA? (10%)
4. Please list and brief describe three different ways to assay protein-protein interaction. (10%)