

中山醫學大學 100 學年度碩士班入學招生考試試題

醫學檢驗暨生物技術學系碩士班 (甲組)

考試科目：生物化學 (含分子生物學)

時間：80 分鐘

※請注意本試題共(2)張，如發現頁數不足，應當場請求補齊，否則缺頁部份概以零分計算。 第 (1) 頁

本試題共二大題，總分 100 分。

一、選擇題：(每題 3 分) (60%)

1. Prokaryotic chromosomes do not have telomeres because:
(A) they do not go through mitosis (B) they do not go through DNA replication
(C) they are in the cytoplasm (D) they are circular
2. Where is the binding site in DNA for transcription activation in eukaryotic cells?
(A) operon (B) enhancer (C) promoter (D) none of the above
3. A typical telomere has a simple repeating structure with a _____-rich strand that extends beyond the C-A- rich strand.
(A) A-T (B) T-G (C) G-T (D) A-G
4. Which histone protein is not located in the nucleosome core?
(A) H3 (B) H2A (C) H2B (D) H1
5. Which enzyme is a type of reverse transcriptase?
(A) RNA replicase (B) Telomerase
(C) Polyadenylate polymerase (D) polynucleotide phosphorylase
6. Which of the following single strands would be part of a palindrome in the double-stranded DNA?
(A) GAATTC (B) ATGATG (C) CTAATC (D) CCCTTT
7. A radioisotope used to label proteins differentially from nucleic acid is
(A) ^{32}P (B) ^{35}S (C) ^{14}C (D) ^{15}N
8. Which molecules are required for DNA sequencing by the Sanger method except _____?
(A) dATP (B) ddATP (C) ATP (D) DNA
9. What type modification not finds in histone?
(A) methylation (B) acetylation (C) phosphorylation (D) glycosylation
10. Which event does not commonly happen in apoptotic cell death?
(A) membrane blebbing (B) chromatin condensed
(C) mRNA degrade (D) DNA fragmentation

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11. Which methods can be used to determine the structure of protein?
(A) SDS-PAGE (B) Nuclear magnetic resonance (NMR)
(C) Edman degradation (D) Tandem mass spectrometer (MS) or MS/MS
12. In eukaryotic cells, the citric acid cycle occurs in the
(A) chloroplasts (B) mitochondria (C) nucleus (D) cytosol
13. Glycine, alanine, proline, valine and leucine are all _____ amino acid.
(A) polar (B) nonpolar (C) acidic (D) basic
14. The net ATP production from lactate fermentation of glucose is
(A) 4 (B) 2 (C) 8 (D) 20 (E) 10
15. Which of the following is a ω -3 fatty acid?
(A) oleic acid (B) linoleic acid (C) stearic acid (D) α -linoleic acid (E) γ -linoleic acid
16. Which of the following compounds is not second messengers?
(A) cAMP (B) cGMP (C) diacylglycerol (D) nitric oxide (E) inositol triphosphate
17. Which amino acid residue is the potential acetylation site of a protein?
(A) Lysine (B) glutamine (C) glutamic acid (D) glycine (E) isoleucine
18. Which of the following sequence is not the regular splice site?
(A) GC.....AG (B) GU.....AG (C) AU.....AG (D) AU.....AC
19. Sequential reaction in gluconeogenesis are starting from _____.
(A) glucose (B) pyruvate (C) oxaloacetate (D) phosphoenolpyruvate
20. Which is not correct regarding polymerase chain reaction (PCR)?
(A) need DNA template (B) need a pair of specific primers
(C) need polyadenylate polymerase (D) conceived by Kary Mullis in 1983

二、問答題：(40%)

1. What is RNA interference (RNAi)? Please explain the mechanism. (10%)
2. What is imprinting? Please explain the mechanism. (10%)
3. What is epigenetic inheritance? Please explain its significance. (10%)
4. Distinguish a missense and a nonsense mutation. (10%)