

國立中央大學97學年度碩士班考試入學試題卷

所別：生物資訊與系統生物研究所碩士班 一般生 科目：生物化學 共 2 頁 第 1 頁

學位在職生

\*請在試卷答案卷(卡)內作答

**Multiple choice questions (total 100%):** each of questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case.

- Common lesion found in DNA after exposure to ultraviolet light are not able to be repaired by
  - Nucleotide excision repair system
  - Recombinational repair system
  - DNA photolyase
  - Base excision repair system
  - Alkyltransferase
- Which of the following types of bonds or interaction are likely to be involved in stabilizing the three-dimensional folding of most proteins
  - Electrostatic bonds
  - Phosphodiester bonds
  - Ester bonds
  - Peptide bonds
  - None
- In the lactose operon model, the repressor protein binds to
  - An enhancer
  - An operator
  - A promoter
  - A TATA box
  - A start codon
- "Leucine zippers" are important in cellular regulation because they are
  - Structures with high redox potential
  - A unique DNA sequences for protein binding
  - A domain in many growth factor receptors
  - A motif in many DNA-binding proteins
  - At the catalytic site of many kinases
- Which of the following is most likely to lead to a loss of gene function?
  - A change from a TGA codon to a TAA codon in the coding region
  - A change from C to T in an enhancer region
  - A change from A to G in the open reading frame
  - A frameshift mutation in promoter region
  - A single nucleotide polymorphism in coding region
- Which of the following columns are used in purification of eukaryotic mRNA?
  - Ni-NTA-column
  - Oligo-dT column
  - Oligo-dG column
  - GST column
  - IgG column
- Which of the following enzyme abnormalities result in hyperuricemia and gout?
  - Hypoxanthine-guanine phosphoribosyltransferase
  - PRPP amidotransferase
  - PRPP synthetase
  - All above
  - None
- Which of the following protein responds to damage DNA and induces activation of SOS regulon?
  - Lex A
  - Rec A
  - Sul A
  - Uvr A
  - Dna A
- The peptide bond formation between two amino acids is catalyzed by
  - The large subunit of a ribosome
  - The small subunit of a ribosome
  - Aminoacyl tRNA synthetase
  - EF-Tu
  - 16S rRNA

參考用

注意：背面有試題

10. Which of the following descriptions about eukaryotic mRNA is NOT TRUE?

- (A) Synthesize in the nucleus
- (B) Has 7-methylguanosine at the 5' end
- (C) Has the polyadenylation at 3' end
- (D) Contain introns
- (E) None

Questions 11-14 refer to the following enzymes

- (A) Telomerase
- (B) RNA polymerase
- (C) DNA polymerase
- (D) Helicase
- (E) RNase H

11. An enzyme is required for polymerase chain reaction

12. An enzyme is required for degradation of RNA

13. An enzyme is required for separation of two strands of DNA

14. An enzyme is required for replication of the end of eukaryotic chromosomes

Questions 15-18 refer to the following enzymes

- (A) Arginase
- (B) Glucose-6-phosphate dehydrogenase
- (C)  $\beta$ -ketothiolase
- (D) Rubisco
- (E) Citrate synthase

15. A glyoxylate cycle enzyme

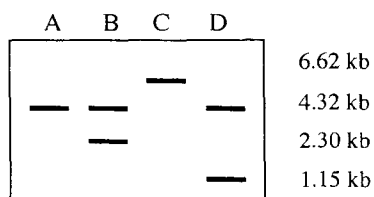
16. A Krebs-Henseleit urea cycle enzyme

17. An enzyme of the pentose phosphate pathway

18. A Calvin cycle enzyme

Questions 19-20

In A plasmid DNA (pBR322, 4.32 Kb) was cleaved with HindIII nuclease and ligate with a HindIII digest of human polymerase  $\beta$  gene. The recombinant plasmid DNA was analyzed by gel electrophoresis of restriction cleavage fragments, with the following results: lane A= HindIII-treated vector, lane B= HindIII -treated recombinant, lane C= EcoRI-treated recombinant, lane D=NotI and HindIII-treated recombinant.



19. The size of human polymerase  $\beta$  gene is

- (A) 6.62 Kb
- (B) 4.32 Kb
- (C) 2.30 Kb
- (D) 1.15 Kb
- (E) 10.94 kb

20. Which of the following descriptions is TRUE?

- (A) Two HindIII cutting sites in the recombinant
- (B) Two EcoRI cutting sites in the recombinant
- (C) Two NotI cutting sites in recombinant
- (D) One HindIII cutting sites in the recombinant
- (E) One NotI cutting sites in the vector

參考用

注意：背面有試題