

Part I. Multiple choice questions (total 60%): each of questions or incomplete statements below is followed by five suggested answers or completions. Select the one that is best in each case.

1. The individuals who are deficient in which of following enzymes are the one most sensitive to antimalarial drugs primaquine
(A) 6-phosphogluconate dehydrogenase
(B) Glutamate dehydrogenase
(C) Glyceraldehyde-3-phosphate dehydrogenase
(D) Glucose-6-phosphate dehydrogenase
(E) Lactonase
2. The coenzyme which is required for carboxylation of pyruvate is
(A) Coenzyme A (B) Thiamine pyrophosphate (C) Flavin adenine dinucleotide (D) Biotin (E) Vitamin B12
3. Fuel store in skeletal muscle
(A) Glucose (B) Triacylglycerol (C) Lactate (D) Glycogen (E) None
4. Which of the following types of bonds or interaction are likely to be involved in stabilizing the three-dimensional folding of most proteins
(A) Phosphodiester bonds (B) Ester bonds (C) Electrostatic bonds (D) Peptide bonds (E) None
5. RNA molecules that exhibit catalytic activity are called
(A) Ribozymes (B) Ribonucleotides (C) mRNAs (D) Ribonucleases (E) Ribosomes
6. Ribosome is responsible for protein synthesis. Which part of ribosome has the major activity to link amino acid to peptide chain?
(A) 16S rRNA (B) 5S rRNA (C) Large ribosomal proteins (D) Small ribosomal proteins (E) 23S rRNA
7. The specialized structures located at the ends of eukaryotic chromosomes are called
(A) Terminators (B) Telomeres (C) Long terminal repeats (LTR's) (D) Centromeres (E) Kinetochores
8. A hydrophobic protein is most likely to have the highest proportion of which of the following amino acid residues buried within its core?
(A) Arginine (B) Isoleucine (C) Leucine (D) Valine (E) Glycine
9. During glycolysis, each molecule of glucose is converted into
(A) 2 molecules of fructose 1,6 bisphosphate
(B) 2 molecules of pyruvate
(C) 4 molecules of NADH
(D) 4 molecules of ATP
(E) 4 molecules of GTP
10. In the citric acid cycle, CO₂ generation are catalyzed by
(A) Succinate dehydrogenase and malate dehydrogenase
(B) Isocitrate dehydrogenase and malate dehydrogenase
(C) Isocitrate dehydrogenase and α -ketoglutarate dehydrogenase
(D) α -ketoglutarate dehydrogenase and succinate dehydrogenase
(E) α -ketoglutarate dehydrogenase and malate dehydrogenase
11. Which of the following is an intermediate in the reaction catalyzed by aminoacyl-tRNA synthetase?
(A) Pyrophosphorylated 3' hydroxyl on the tRNA
(B) Aminoacyl phosphate
(C) Aminoacyl pyrophosphate
(D) Aminoacyl adenylate
(E) None of the above

參考用

注意：背面有試題

國立中央大學103學年度碩士班考試入學試題卷

所別：企業管理學系碩士班 一般乙組(一般生)

科目：生物化學(含分子生物學)

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本科考試禁用計算器

*請在試卷答案卷(卡)內作答

Questions 12-15 refer to the following enzymes

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

- 12. A glyoxylate cycle enzyme _____
- 13. A Krebs-Henseleit urea cycle enzyme _____
- 14. An enzyme of the pentose phosphate pathway _____
- 15. A Calvin cycle enzyme _____

Questions 16-18 refer to the following enzymes

- (A) Hypoxanthine-guanine phosphoribosyltransferase
- (B) Cyclooxygenase
- (C) Reductase
- (D) Tyrosinase
- (E) Tryptophan oxygenase

- 16. The enzyme that aspirin acts on _____
- 17. The enzyme abnormality results in hyperuricemia and gout _____
- 18. The enzyme abnormality results in albinism _____

Questions 19-21 refer to the following sequences.

Genomic sequence of gene X is

5'GGCTGATGCCAATCGCCGAATTGTACTGAACC-3'.

- (A) 5'-CCGACTACGGTTAGCGGCTTAACATGACTTGG-3'
- (B) 5'-GGTTCAGTACAATTCGGCGATTGGCATCAGCC-3'
- (C) 5'-CCGACUACGGUUAGCGGCUUAACAUGACUUGG-3'
- (D) 5'-GGCUGAUGCCAAUCGCCGAAUUGUACUGAACC-3'
- (E) 5'-GGUUCAGUACAAUUCGGCGAUUGGCAUCAGCC-3'

- 19. Which sequence is DNA template for RNA transcription? _____
- 20. Which sequence is gene transcript? _____
- 21. Which sequence is complementary strand of gene X? _____

Questions 22-25 refer to the following enzymes.

- (A) DNA polymerase δ
- (B) DNA polymerase α
- (C) DNA ligase
- (D) DNA helicase
- (E) Topoisomerase

- 22. Which enzyme is required to link two Okazaki fragments? _____
- 23. Which enzyme is required to unwind double-stranded DNA? _____
- 24. Which enzyme has proofreading function? _____
- 25. Which enzyme is required to initiate replication? _____

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Questions 26-30 refer to the following terms

- (A) Cholesterol
- (B) 7-dehydrocholesterol
- (C) Phosphoribosylpyrophosphate
- (D) Uric acid
- (E) α phosphate

26. The major route in mammals to convert lanosterol to cholesterol is through _____
27. Steroid hormone are derived from _____
28. The precursor for de novo synthesis of purine nucleotides _____
29. The final product of purine metabolism in primate _____
30. In the triphosphates, the phosphate immediately attached to the 5' carbon is designated as _____

Part II Short Answer and Essay Questions (total 40%):

1. Which amino acids have positively charged at physiological pH? (6%)
2. What is β -oxidation and why is so called? (9%)
3. Ketoacidosis is a diagnostic feature of diabetes. How is caused in diabetes. (10%)
4. What are the differences between prokaryotic and eukaryotic mRNA? (15%)

