臺北醫學大學 90 學年度第 2 學期 期中/期末 考試 命(試)題紙

系級	科目	授課教師	考試日期	學號	姓名
藥二	生物化學	張建志	91 年 6 月 20 日第 ___ 節		

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Answer ALL questions, as there is no penalty for wrong answers. (26%)

( ) 1 The hormone epinephrine (also known as adrenaline) is derived from which amino acid? (A) phenylalanine (B) glycine (C) tyrosine (D) histidine (E) arginine

( ) 2 When glutamate dehydrogenase generates α-ketoglutarate from glutamate, which of the following molecules is utilized? (A) NAD^+ (B) $NADP^+$ (C) NADH (D) NADPH (E) none of the above

( ) 3 Urea is the byproduct of which enzymatic reaction? (A) arginosuccinate synthetase (B) arginase (C) arginosuccinase (D) ornithine transcarbamoylase (E) carbamoyl phosphate synthetase I

( ) 4 Which of the following enzymes catalyzes the initial reaction in polyamine biosynthesis? (A) carbamoyl phosphate synthetase I (B) aspartate transcarbamoylase (C) thymidylate synthase (D) serine hydroxymethyltransferase (E) ornithine decarboxylase

( ) 5 What is the cellular role of ubiquitin? (A) protein translocation (B) protein folding (C) protein degradation (D) calcium binding protein (E) electron transport

( ) 6 Nitric oxide is synthesized by NO synthase from what? (A) lysine (B) glutamine (C) arginine (D) asparagine (E) tryptophan

( ) 7 Which of the following compounds does NOT contribute any carbons directly to purine biosynthesis? (A) lysine (B) glycine (C) glutamine (D) CO_2 (E) tetrahydrofolate

( ) 8 What is (are) the biochemical and genetic symptoms of Lesch-Nyhan syndrome? (A) insufficient ATP in bloodstream (B) deficiency of HGPRT enzyme (C) elevated serum uric acid levels (D) A and C (E) B and C

( ) 9 During the biosynthesis of dTMP, which of the following is the immediate precursor of dTMP? (A) TMP (B) TDP (C) dUMP (D) UMP (E) UDP

( ) 10 The chemotherapeutic drug methotrexate reduces DNA synthesis by inhibiting: (A) ribonucleotide reductase (B) dihydrofolate reductase (C) glutathione reductase (D) HMG-CoA reductase (E) thioredoxin reductase

( ) 11 Which of the following enzyme activity in serum is an indicator of liver damage? (A) malate dehydrogenase (B) dihydrofolate reductase (C) thymidylate synthase (D) PRPP synthetase (E) alanine aminotransferase

( ) 12 The two enzyme catalyzed reactions that utilize cobalamin (from Vitamin B_{12}) as a cofactor are the ones converting: (A) methylmalonyl-CoA to succinyl CoA and homocysteine to methionine (B) aspartate to oxaloacetate and glutamate to γ-aminobutyric acid (GABA) (C) tryptophan to serotonin and tyrosine to 3,4-dihydroxyphenylalanine (DOPA) (D) norepinephrine to epinephrine and lysine to trimethyllysine (E) valine to α-ketoisovaleric acid and α-ketoisovaleric acid to isobutyryl COA

( ) 13 Uric acid is: (A) a highly water-soluble pyrimidine analog (B) a rather insoluble pyrimidine analog (C) a highly water-soluble purine analog (D) a rather insoluble purine analog (E) none of the above

私立臺北醫學院 90 學年度第 2 學期 期中 期末 考試 命(試)題紙

系級	科目	授課教師	考試日期	學號	姓名
藥武二	生物化學	張建彬	91 年 6 月 20 日第____節		

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I. Single choice (18%)

1. Glycolysis
   (a) requires molecular oxygen to generate energy (b) does not require molecular oxygen to generate energy
   (c) is inhibited by oxygen (d) rate is increased in the presence of oxygen
2. The final product in phase I of glycolysis is
   (a) fructose-1,6-bisphosphate (b) glyceraldehydes-3-phosphate (c) pyruvate (d) glucose-6-phosphate
3. How many reactions in the glycolytic pathway consume or produce ATP?
   (a) 2 (b) 3 (c) 4 (d) 6
4. Pyruvate in humans can be converted to
   (a) acetyl-CoA (b) lactate only (c) ethanol only (d) acetyl-CoA and lactate
5. Both hexokinase and glucokinase are found in the liver. Glucokinase has a Km value of 10 mM, with the Km value for hexokinase being less than 1 mM. The data are consistent with which of the following statement?
   (a) glucokinase acts on glucose at low levels (b) glucokinase acts on glucose only at very high concentrations
   (c) glucokinase plays a major role in glucose metaboism at low glucose levels (d) hexokinase acts on glucose only at high levels of glucose
6. Phosphofructokinase is an enzyme that regulates the rate of glycolysis. Which of the following statements is characteristic of this enzyme?
   (a) phosphofructokinase is not an allosteric enzyme (b) citrate increases the activity of phosphofructokinase
   (c) AMP increases the activity of phosphofructokinase (d) phosphofructokinase activity is a function of free energy
7. An enzyme not involved in the regulation of glycolysis is
   (a) hexokinase (b) triose phosphate isomerase(c) pyruvate kinase (d) phosphofructokinase
8. The glycolytic enzyme influenced by the hormone glucagons is
   (a) triose phosphate isomerase (b) pyruvate kinase (c) hexokinase (d) lactate dehydrogenase

9. Indicate the cellular location of the following glycolysis ____________________

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藥二	生物化學	陳建安	91年6月20日第 節		

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藥一、二 (25%)

1. ( ) Fatty acid was degraded by (a) CoASH addition (b) carboxylation (c) methylation (d) beta-oxidation (e) glycolysis
2. ( ) The first step of fatty acid synthesis is catalyzed by (a) fatty acid synthase (b) acetyl-CoA carboxylase (c) citrate synthase (d) Isomerase (e) reductase
3. ( ) The steroid hormones are converted from (a) triacylglycerol (b) protein (c) cholesterol (d) phospholipid (e) acetyl-CoA
4. ( ) Which form of energy compound is used in synthesis of glycerol-phospholipid (a) ATP (b) NADH (c) NADPH (d) CTP (e) GTP
5. ( ) Which compound is the key substrate in cholesterol synthesis (a) acetyl-CoA (b) HMG-CoA (c) mevalonate (d) cholic acid (e) acetoacetate
6. ( ) The respirator stress syndrome is induced by which compound deficiency (a) ganglioside (b) galactosidase (c) dipalmitoylphosphotidylcholine (d) ceramidase (e) sphingomyelin
7. ( ) Which compound is the source of acetyl-CoA at fatty acid synthesis from mitochondria (a) pyruvate (b) fatty acid (c) citrate (d) oxaloacetate (e) manoyl-CoA
8. ( ) Which is called " good cholesterol" (a) chylomicron (b) VLDL (c) LDL (d) IDL (e) HDL
9. ( ) Cholesterol is transported from circulation to peripheral tissue by which lipoprotein (a) chylomicron (b) VLDL (c) LDL (d) IDL (e) HDL
10. ( ) The lovastatin is the inhibiter to which protein (a) acetyl-CoA carboxylase (b) phosphodieasterase (c) HMG-CoA lyase (d) HMG-CoA reductase (e) fatty acyl-CoA synthase
11. ( ) Which protein in mitochondria outer-membrane is necessary in process of fatty acyl-CoA transport from cytosol to matrix of mitochondria (a) carnitine acyltransferase I (b) carnitine acyltransferase II (c) translocase (d) NADH dehydrogenase (e) thiolase
12. ( ) How many molecules of NADPH is needed in steric acid (C18:0) synthesis (a) 13 (b) 14 (d) 15 (e) 16

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( ) 1. **A.** Helicase **B.** DNA polymerase III **C.** DNA gyrase **D.** DNA topoisomerase catalyzes the unwinding of double-stranded DNA under the process of DNA replication.

( ) 2. Topoisomerases, a group of enzymes that change supercoiling of DNA helices by either allowing the superhelical torsion to relax or adding more twists. Which type topoisomerase catalyze double-strand breakage and rejoining to concert the positive supertwist to a negative one? **A.** topoisomerase I **B.** topoisomerase II **C.** topoisomerase III **D.** topoisomerase IV

( ) 3. In DNA replication, the leading daughter DNA strand is elongated continuously in direction. The lagging strand is synthesized discontinuously, each fragment is synthesized in direction.
A. 5'→3' ; 3'→5' **B.** 3'→5' ; 5'→3' **C.** 5'→3' ; 5'→3' **D.** 3'→5' ; 3'→5'.

( ) 4. Methylation is responsible for the tissue-specific inactivation of genes during development. The sole methylated base in eukaryotic DNA is **A.** N^4-methylcytosine **B.** N^6-methyladenine **C.** 5-azacytidine **D.** 5-methylcytosine.

( ) 5. Base excision repair removes one or more nucleotides from a site of base damage. The precess initiates with enzymatic cleavage of glycosidic bond between the damaged base and deoxyribose. **A.** photolyase **B.** alkyltransferase **C.** excinuclease **D.** DNA-*N*-glycosylase.

( ) 6. **A.** Genome mapping **B.** Southern blotting **C.** Gene cloning **D.** Footprinting technique can be used to detect the presence of a specific DNA sequence in a genome.

( ) 7. The function of σ subunit of *E. coli* RNA polymerase is **A.** chain initiation **B.** chain elongation **C.** DNA binding **D.** promoter recognition.

( ) 8. DNA sequences that promote transcriptional factor-independent termination include a run of 4-8 A residues and a **A.** GC **B.** AT **C.** GT **D.** AG rich region that forms a stem-loop.

( ) 9. **A.** Recombination **B.** Attenuation **C.** Suppression mutation **D.** Operon is a mechanism for regulating prokaryotic gene expression in which the synthesis of a mRNA is terminated before RNA polymerase has reached the structural genes.

( ) 10. **A.** UAG **B.** UAA **C.** UUC **D.** UGA is not the stop codon.

( )11. The order of mRNA processing in eukaryotes is **A.** capping→polyadenylation→splicing **B.** polyadenylation → capping → splicing **C.** capping → splicing → polyadenylation **D.** polyadenylation→splicing→capping.

( )12. **A.** Chaperonin **B.** Signal recognition particle **C.** Ubiquitin **D.** Proteasome is involve in managing the folding of other proteins.