臺北醫學大學 92 學年度第 1 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
保二	生物化學	陳建志等	93年1月9日第一節		

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Single choice (each question is worth two points)

( ) 1. Glycolysis is a 10-step pathway that converts one molecule of glucose to two molecules of (A) lactate (B) pyruvate (C) acetyl CoA (D) NADH, with the concomitant generation of two molecules of ATP. (p.448)

( ) 2. Lactic acid bacteria simply use NADH to reduce pyruvate to lactate via the enzyme (A) lactate dehydrogenase (B) pyruvate dehydrogenase (C) alcohol dehydrogenase (D) NADH dehydrogenase. (p.448)

( ) 3. Which of the following is not the major routes of ATP synthesis? (A) substrate level phosphorylation (B) oxidative phosphorylation (C) covalent modification (D) photophosphorylation. (p.450)

( ) 4. Which compound contains energy-rich phosphate bond? (A) pyruvate kinase (B) glyceraldehydes 3-phosphate (C) phosphoenolpyruvate (D) fructose 1,6-bisphosphate. (p.450)

( ) 5. Isomerization of glucose to fructose-6-phosphate proceeds via an (A) enol (B) enediol (C) aldol (D) christian dior. (p.452)

( ) 6. Which reaction of the following is not involved in glycolysis? (A) hydration (B) isomerization (C) dehydrogenation (D) phosphorylation. (p.451)

( ) 7. (A) Phosphofructokinase (B) Glucokinase (C) Pyruvate kinase (D) Hexokinase is inhibited by glucose-6-phosphate. (p.452)

( ) 8. Which amino acid of the following is not in the active site of fructose-1,6- bisphosphate aldolase? (A) lysine (B) cysteine (C) histidine (D) glutamate. (p.454)

( ) 9. Glyceraldehyde-3-phosphate dehydrogenase is inhibited by (A) arsenite (B) iodoacetate (C) arsenate (D) Mg2+. (p.455)

( ) 10. (A) Lactate dehydrogenase (B) Pyruvate dehydrogenase (C) Glyceraldehyde-3-phosphate dehydrogenase (D) NADH dehydrogenase creates a high-energy compound and generates a pair of reducing equivalents in glycolysis. (p.455)

( ) 11. Phosphoglycerate mutase contains a (A) phosphocholine (B) phosphoserine (C) phosphohistidine (D) phosphoinositol residue in the active site. (p.456)

( ) 12. (A) Phosphoglycerate kinase (B) Pyruvate kinase (C) Hexokinase (D) Phosphofructokinase catalyzes the second glycolytic reaction that forms ATP. (p.457)

( ) 13. Myocardial infarction will result in increase of the serum level of (A) LDH-1 (B) LDH-2 (C) LDH-4 (D) LDH-5. (p.461)

( ) 14. Which of the following reaction does not require thiamine pyrophosphate as a coenzyme? (A) pyruvate dehydrogenase (B) pyruvate decarboxylase (C) α-ketoglutarate dehydrogeanse (D) succinate dehydrogenase. (p.461)

( ) 15. Which of the following does not activates phosphofructokinase? (A) ADP (B) AMP (C) fructose-2,6-bisphosphate (D) ATP. (p.464).

( ) 16. Galactosemia results from hereditary deficiency of (A) UDP-Glc:Gal-1-P uridylyltransferase (B) phosphoglucomutase (C) UDP-Glc pyrophosphorylase (D) lactase. (p. 469)

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( ) 17. Which of the following does not catalyze the gluconeogensis? (A) pyruvate carboxylase (B) PEPCK (C) hexokinase (D) aldolase. (p. 563)

( ) 18. Glycogen mobilization is controlled hormonally by a metabolic cascade that is activated by (A) G-protein (B) cAMP (C) adenylate cyclase (D) phosphorylase kinase formation and involves successive phosphorylations of enzymes protein. (p. 474)

( ) 19. Which of the following is not the substrate of citric acid cycle? (A) isocitrate (B) trans-aconitate (C) succinyl-CoA (D) oxaloacetate. (p.487).

( ) 20.One turn of the citric acid cycle generates (A) one (B) two (C) three (D) four NADH for subsequent reoxidation. (p. 503)

( ) 21. (A) Coenzyme A (B) Lipoic acid (C) FAD (D) Thiamine pyrophosphate participates in activation of acyl groups in general, including the acetyl group derived from pyruvate. (p.494)

( ) 22. Which of the following coenzyme is not joined to its apoenzyme via an amide bond linking its carboxyl group to a lysine ε-amino group? (A) lipoic acid (B) biotin (C) FAD (D) none of above. (p.492)

( ) 23. (A) Iodoacetate (B) Fluoroacetate (C) Iron-sulfur (D) Suicide substrate acts as a poison by being converted via citrate synthase, to the aconitase inhibitor fluorocitrate. (p. 498)

( ) 24. Two carbon atoms enter the citric acid cycle as acetyl CoA, and two are lost as CO_2 in the reactions (A) 1 and 2 (B) 3 and 4 (C) 5 and 6 (D) 7 and 8 of the cycle. (p. 499)

( ) 25. The reaction of isocitrate dehydrogenase involves dehydrogenation to (A) α-ketoglutarate (B) oxalosuccinate (C) succinyl CoA (D) oxaloacetate, an unstable enzyme-bound intermediate. (p. 498)

( ) 26. (A) Succinate dehydrogenase (B) Fumarase (C) Malate dehydrogenase (D) Succinyl-CoA synthetase is tightly bound to the mitochondrial inner membrane. (p. 501)

( ) 27. FAD is bound covalently to succinate dehydrogenase protein through a specific (A) lysine (B) serine (C) cysteine (D) histidine residue. (p. 502)

( ) 28. Activity of the pyruvate dehydrogenase complex is regulated by phosphorylation of the (A) E_1 (B) E_2 (C) E_3 (D) E_4 subunit. (p. 504)

( ) 29. A dihydroxyacetone phosphate is oxidized in brain through glycolysis, citric acid cycle and electron transport chain into H_2O and CO_2, generating (A) 38 (B) 36 (C) 20 (D) 19 ATP. (p. 537)

( ) 30. (A) Liver (B) Kidney (C) Muscle (D) Heart is the major gluconeogenic tissue. (p. 534)

( ) 31. The pentose phosphate pathway does not primarily generate (A) NADH (B) NADPH (C) ribose-5-phosphate (D) fructose-6-phosphate. (p. 512)

( ) 32. F_1 ATP synthase as a (A) rotary (B) sliding (C) vibration (D) swing engine driving the synthesis of ATP. (p. 546)

( ) 33. Which of the following does transfer one electron in the respiratory chain? (A) cytochrome c (B) coenzyme Q (C) FMN (D) flavoprotein. (p. 525)

( ) 34. Complex I contains (A) FAD (B) FeS (C) FMN (D) cyt b_{560} as a tightly bound prosthetic group. (p. 529)

( ) 35. Which complex contains 13 polypeptides with 170kDa mass? (A) I (B) II (C) III (D) IV. (p. 536)

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921 保二生化 Final (15%) Rita-Huang

一 多選題 (1.5 points each)

1. Transport of fatty acids from the cytolasma to the mitochondrial matrix requires:
   A. ATP, coenzyme A, an hexokinase
   B. ATP, carnitine, and coenzyme A
   C. Carnitine, coenzyme A, and hexokinase
   D. ATP, carnitine, and pyruvate dehydrogenas
   E. ATP, coenzyme A, and pyruvate dehydrogenase

2. Which of the following is not true regarding the oxidation of one mole of palmitate (16: 0) by the β-oxidation pathway ?
   A. 8 moles of acetyl-CoA are formed
   B. 1 mole of ATP is needed
   C. 8 moles of $FADH_2$ are formed
   D. The reactions occur in the mitochondria
   E. AMP and PPi are formed

3. Which of the following statements apply to the β oxidation of fatty acids ?
   1. The process take place in the cytosol of mammalian cells
   2. Carbon atoms are removed from the acyl chain one at a time
   3. Before oxidation, fatty acids must be converted to their CoA derivatives
   4. NADP+ is the electron acceptor
   5. The products of β oxidation can directly enter the citric acid cycle for further oxidation

   A. 1, 2, and 3
   B. 1, 2, and 5
   C. 3 and 5 only
   D. 1 and 3 only
   E. 4 only

4. 神經系統的病變常常是因哪一個 lipid 的代謝途徑產生 Defect 所致 ? (A) PC (B) PE (C) Cholesterol (D) Sphingomyelin
5. 下列何者是 Ketone body 的成分 ? (A) Acetyl CoA (B) malonyl CoA (C) Acetoacetate (D) β-hydroxybutyrate
6. 對 "抗凝血" 的機制有影響的是(A) PGE_2 (B) PGD_2 (C) TXA_2 (D)PGI_2
7. Eukaryote 系統可以從 Choline 合成 PC, 其過程須經 E1, E2, E3 三種酵素, 請問其中最重要的關鍵性酵素爲 (A) E1 (B) E2 (C) E3
8. 承上題, 此關鍵性酵素的活化狀態爲 (A) phosphorylated form, associated with ER (B) dephosphorylated from, associated with ER (C) phosphorylated form, deassociated with ER (D) dephosphorylated form, deassociated with ER.

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9. 在微血管經由 lipase 作用而切下的 free fatty acid, 是經由什麼機制進入周邊組織細胞進行代謝 ? (A) active transport (B) passive transport (C) co-transport

10. Please describe the mechanism for moving acetyl-CoA produced in the mitochondrial matrix into the cytosol for fatty acid synthesis. (3 points)

臺北醫學大學 97 學年度第 1 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
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保二 生化試題 鄭可大 選擇題 (15%)

( )1. DNA replication results in: A. Two new daughter strands B. Heavy DNA C. Protein production D. Induced mutations

( )2. 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. (3%) **A.** 5'→3' ; 3'→5' **B.** 3'→5' ; 5'→3'
C. 5'→3' ; 5'→3' **D.** 3'→5' ; 3'→5'.

( )3. The site of protein synthesis is:
A. DNA B. The ribosome
C. The nucleus D. The cell membrane

( )4. To make protein, the cell must first transcribe the genetic code from DNA to produce mRNA. The genetic code on mRNA is in the form of codons, which are:
A. Helix-turn-helix structures B. Positively charged bases
C. A set of three adjacent bases D. DNA-RNA hybrids

( )5. Of the DNA molecules listed in the table, which would you expect to have the highest T_m?
(3%) **A.** Simian virus 40 **B.** Bacteriophage § 174 **C.** Epstein-Barr virus **D.** Bacterium *E. coli*.

Source	Number of base pairs (bps) or bases (b)	(G+C)%
Simian virus 40	5243 bp	40.80
Bacteriophage § 174	5386 b	44.76
Epstein-Barr virus	172,282 bp	59.94
Bacterium *E. coli*	4,639,221 bp	50.80

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1. 請以 dopamine biosynthesis 說明 vitamin-mineral interaction (10 分)

2. Pyruvate 經酵素作用轉變為 acetyl CoA 需哪些輔酵素參與？(5 分)