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一. 單選題(每題2.5分；共100分)

1. Which of the following respiratory complexes contains only the nuclear DNA-encoded proteins? (A) Complex I (B) Complex II (C) Complex III (D) Complex IV (E) Complex V.
2. α helix of a polypeptide has a pitch of ___ nm/turn. (A) 0.34 (B) 0.54 (C) 3.4 (D) 3.6 (E) 5.4.
3. Which of the following descriptions about Hb (hemoglobin) is incorrect? (A) One Hb can bind 4 O_2 molecules (B) HbA has an $\alpha_2\beta_2$ structure (C) HbF has an $\alpha_2\gamma_2$ structure (D) HbF has a lower affinity for 2,3-BPG than does HbA (E) Decreased 2,3-BPG levels are found in the blood of smokers.
4. Which of the following descriptions about the Michaelis-Menten rate equation is incorrect? (A) K_M measures the substrate concentration at which the reaction rate is $V_{max}/2$ (B) k_{cat} is the turnover number that measures the rate of the catalytic process (C) The ratio of k_{cat}/K_M is a convenient measure of enzyme efficiency (D) $k_{cat} = V_{max}/K_M$ (E) A competitive inhibitor increases the apparent K_M.
5. To visualize a DNA band, ___ is commonly used after agarose gel electrophoresis. (A) Uridine (B) EtBr (C) coomassie brilliant blue (D) CNBr (E) BUdR.
6. A DNA segment of 100 base pairs in the Z form. What is its approximate molecular weight? (A) 33 (B) 65 (C) 330 (D) 650 (E) 3,300 kD.
7. Absorbance at ___ nm is frequently used to determine the concentration of DNA. (A) 200 (B) 260 (C) 280 (D) 400 (E) 540.
8. Which of the following compounds has the lowest molecular weight? (A) guanine (B) guanosine (C) guanylate (D) cytosine (E) cytidine.
9. Which of the following descriptions regarding disaccharide is incorrect? (A) Sucrose is a non-reducing sugar (B) Sucrose is α-D-glucopyranosyl (1→4) β-D-fructofuranoside (C) Maltose has an α(1→4) linkage (D) Cellobiose is β-D-glucopyranosyl (1→4) β-D-glucopyranose (E) Lactose is a reducing sugar.
10. Which of the following restriction endonucleases is an isoschizomer of XbaI (TCTAGA)? (A) EcoRI (GAATTC) (B) SpeI (ACTAGT) (C) BamHI (GGATCC) (D) SalI (GTCGAC) (E) EagI (CGGCCG).
11. Which of the following proteins is involved in scrapie? (A) collagen (B) elastin (C) keratin (D) prion (E) chaperonine.
12. NP-40 is a nonionic surfactant that denatures proteins by disrupting ____? (A) hydrogen bonds (B) disulfide bridges (C) hydrophobic interactions (D) salt bridges (E) covalent bonds.
13. How many stereoisomers for an aldohexose? (A) 2 (B) 4 (C) 8 (D) 16 (E) 32.
14. The chemical bond between ribose and base of a nucleotide is a(n) ___ bond. (A) ether (B) ester (C) glycosidic (D) aldehyde (E) ketone.
15. Which of the following lipids are especially common in the membranes of brain and nerve cells? (A) glycerophospholipids (B) waxes (C) fatty acids (D) glycosphingolipids (E) glycoglycerolipids.
16. In humans, mitochondrial DNA encodes ___ proteins. (A) 37 (B) 22 (C) 13 (D) 2 (E) 0.
17. The catalytic triad of serine proteases consists of ____, ____, and____? (A) Ser, His, and Asp (B) Phe, Trp, and Tyr (C) Asp, Glu, and Pro (D) His, Asp, and Glu (E) Ser, Thr, and Cys.
18. Which scientist proposed the model of chemiosmotic coupling? (A) P. Mitchell (B) J. D. Watson and H. C. Crick (C) A. D. Hershey and M. Chase (D) S. B. Prusiner (E) F. Sanger.

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19. Which of the following amino acids contains only one codon? (A) Ala (B) Lys (C) Tyr (D) Trp (E) Arg.
20. B form DNA has ___ residues per turn. (A) 1 (B) 2 (C) 3 (D) 5 (E) 10
21. The Southern blotting method is normally used for detection of (A) proteins (B) DNA (C) RNA (D) lipids (E) carbohydrates.
22. Which of the following tautomeric forms of fructose exists in sucrose? (A) α-pyranose (B) β-pyranose (C) α-furanose (D) β-furanose (E) all of the above.
23. Oseltamivir (tamiflu) is effective in treating H1N1 influenza infection, because it has a structure similar to (A) hyaluronic acid (B) heparin (C) N-acetylgalactosamine (D) N-acetylglucosamine (E) sialic acid.
24. Which of the following compounds is frequently used by emergency medical personnel as an antidote for cyanide poisoning? (A) CO (B) rotenone (C) antimycin A (D) azide (E) $NaNO_2$
25. Which pair of enzymes listed below generates NADPH? (A) glucose-6-phosphate dehydrogenase and 6-phosphogluconate dehydrogenase (B) malic enzyme and glucose-6-phosphate dehydrogenase (C) citrate lyase and malic enzyme (D) 6-phosphogluconate dehydrogenase and fructose-bisphosphatase-1 (E) fructose-bisphosphatase-1 and hexose kinase.
26. How many CO_2 molecules are released for each acetyl-CoA entering the glyoxylate cycle in plant cells? (A) 0 (B) 1 (C) 2 (D) 3 (E) 4.
27. The most important regulatory step in glycolysis is catalyzed by ___. (A) hexokinase (B) pyruvate kinase (C) glyceraldehyde-3-phosphate dehydrogenase (D) phosphofructokinase (E) phosphoglycerate kinase.
28. Which of the following enzymes is <u>not</u> involved in the glyoxylate cycle? (A) aconitase (B) isocitrate lyase (C) malate synthase (D) malate dehydrogenase (E) isocitrate dehydrogenase.
29. In a Lineweaver-Burk double reciprocal plot, the intercept of the x-axis equals ___. (A) K_M (B) $-1/K_M$ (C) V_{max} (D) $1/V_{max}$ (E) k_{cat}/K_M.
30. Phosphofructokinase-1 (A) is activated by ADP and citrate (B) is activated by ADP and fructose-2,6-bisphosphate (C) is activated by citrate and fructose-2,6-bisphosphate (D) is activated by ATP and fructose-2,6-bisphosphate (E) is inhibited by ATP and fructose-2,6-bisphosphate
31. Which amino acid lacks a chiral α-carbon? (A) Gly (B) Trp (C) Tyr (D) His (E) Pro.
32. Amino acids can be covalently linked together by formation of a(n) ___ bond. (A) ether (B) ester (C) peptide (D) glycosidic (E) none of the above.
33. How many moles of $FADH_2$ molecules are produced in the TCA cycle per molecule of acetyl-CoA oxidized? (A) 5 (B) 4 (C) 3 (D) 2 (E) 1.
34. The enzymes that catalyze the hydroxylations of proline and lysine residues in collagen requires ___. (A) vitamin A (B) vitamin C (C) vitamin E (D) vitamin B (E) selenocysteine and pyrrolysine.
35. Which enzyme uses $FAD/FADH_2$ in the metabolism of glucose to CO_2? (A) pyruvate dehydrogenase complex (B) isocitrate dehydrogenase (C) α-ketoglutarate dehydrogenase (D) malate dehydrogenase (E) succinate dehydrogenase.
36. Trypsin cleaves proteins at sites next to _____. (A) Lys and Arg (B) Tyr, Trp, and Phe (C) Asp and Glu (D) Met and Cys (E) Ser and Thr.

注意:背面有試題

37. All of the following are paired with their preferred substrate except: (A) brain: glucose (B) heart: fatty acids (C) anaerobic skeletal muscle: glucose (D) red blood cell: fatty acids (E) adipose tissue: fatty acids.
38. The cloverleaf structure of tRNA includes (A) an acceptor stem (B) a TψC-loop (C) a D-loop (D) an anticodon-loop (E) all of the above.
39. Who proposed the binding-change model for the F_0F_1 ATP synthase complex? (A) P. Boyer (B) F. Sanger (C) W. Gilbert (D) J. Walker (E) T. Cech.
40. Which tautomeric form of ribose is the major form in solution? (A) α-pyranose (B) β-pyranose (C) α-furanose (D) β-furanose (E) open-chain form.