※ 注意事項：必須用 2B 鉛筆作答，修正請用橡皮擦，答題前請先詳閱答案卡上之畫記說明。

選擇題(四選一)，共 40 題，每題 2.5 分。

1. The major form of glucose in solution is (A) D-Glucosamine (B)D-Glucuronate (C) D- Ribulose (D) D-Glucopyranose

2. Which of the following description is not correct? (A) Glucose enters into the glycolytic pathway by phosphorylation to glucose-6-phosphate, accomplished by the enzyme hexokinase. (B) Oxidation of glucose yields up to 38 Mol of ATP under aerobic condition. (C) Pyruvate is oxidized to acetyl-CoA by an enzyme known as pyruvate kinase. (D) Fructose 2,6-Bisphosphate plays a unique role in the regulation of glycolysis and gluconeogenesis in liver.

3. Which vitamins are precursors of coenzymes CoA and FAD that used in the TCA cycle. (A) pantothenic acid and thiamin (B) thiamin and niacin (C) niacin and riboflavin (D) riboflavin and pantothenic acid

4. The citric acid cycle is amphibolic, since it takes part in some metabolic pathways. However, which of the following pathway is not included? (A) Oxidation of Pyruvate (B) The synthesis of fatty acids (C) Gluconeogenesis (D) Transamination

5. Gluconengenesis is the process of converting noncarbohydrates to glucose. Which of the following substance is not the significant substrates for this process? (A) glycerol (B) 2,3-bisphosphoglycerate (C) lactate (D) amino acids

6. α-helices are stabilized by which of the force?
(A) hydrophobic interaction (B) vanderwall force (C) hydrogen bonds between the (CO) and the (NH) units in the peptide backbone (D) hydrogen bonding between the R groups.

7. Which of the following reagents is a reducing reagent ?
(A) Performic acid (B) Mercaptoethanol (C) Urea (D) Ninhydrin

8. The equilibrium constant K for the binding of oxygen to myoglobin is 10^{-6} M, where K is defined as
$K = [Mb][O_2] / [MbO_2]$ (Mb = myoglobin)
The rate constant for the combination of O_2 with myoglobin is 2×10^7 $M^{-1}S^{-1}$
What is the rate constant for the dissociation of O2 from oxymyoglobin?
(A) 0.020 S^{-1} (B)0.2 S^{-1} (C) 2.0S^{-1} (D) 20.0S^{-1}

接背面

9. Which one of the following amino acids would be considered most polar?
(A) Serine (B)Valine (C) Proline (D) Phenylanine

10. Globular proteins are characterized by
(A) glycine at every third residue
(B) high concentrations of hydrophobic amino acids on the outside of the molecule
(C) many polar and charged amino acids on the outside of the molecule
(D) large amounts of hydroxyproline

11. IPTG-induction of β-galactosidase activity is the result of
(A) stimulation of Lac repressor function
(B) IPTG binding to the *lac* operon and inducing transcription.
(C) IPTG binding to the *lac*I gene product and inhibiting its activity.
(D) inhibition of β-galactosidase degradation.

12. Coactivator protein influences eukaryotic gene expression by
(A) binding to TATA box
(B) interacting with RNA polymerase directly to enhance transcription
(C) interacting with activators.
(D) binding to cis-element in the promoter region.

13. Which of the following restriction enzymes when used for digesting an *E. coli* genomic DNA sample can generate more DNA fragments. (The cleavage sequence recognized by each enzyme is shown in parenthesis)
(A) *Not* I (GC/GGCCGC)
(B) *Hin*d III (A/AGCTT)
(C) *Hinf* I (G/ANTC)
(D) *Hpa* I (GTT/AAC)

14. Choose the INCORRECT statement describing prokaryotic RNA transcription
(A) No processing reaction for all RNA transcripts
(B) One RNA polymerase is responsible for all mRNA. tRNA and rRNA transcriptions.
(C) mRNA can be polycistronic.
(D) RNA transcription can be coupled with protein translation.

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15. Which of the following factors CANNOT affect the accuracy of quantitation of nucleic acid by $OD_{260\ nm}$ measurement.
(A) pH of the buffer (B) Temperature
(C) trace amount of valine (D) trace amount of tyrosine.

16. Which of the following amino acids or their metabolites can not serve as first messengers?
(A) glutamate (B) tyrosine (C) serine (D) histidine

17. Which of the following lipid metabolites can trigger the activation of G proteins?
(A) 1,25-Dihydroxyvitamin D (B) leukotriene (C) retinoic acid (D) estradiol

18. Phosphatidylinositol breakdown products can trigger which of the following events directly?
(A) mobilization of intracellular calcium (B) O-glycosylation of proteins
(C) forming of atheroslerotic plaques (D) forming of chylomicron-remnant-like particles

19. Which of the following events is happened at the membrane of endoplasmic reticulum?
(A) electron transport chain (B) TCA cycle (C) beta-oxidation of lipids
(D) protein biosynthesis

20. The catalysed product by cyclooxygenase-2 is:
(A) cyclic AMP (B) dihydrocorticosterone (C) prostaglandin
(D) phosphatidylinositol-4,5-bisphosphate

21. Tetracyclin can inhibit the protein biosynthesis of *E. coli*, because the antibiotic inhibits:
(A) chain elongation (B) chain termination
(C) amino acyl-tRNA synthetase (D) peptidyl transferase.

22. Actinomycin D inhibits the activity of:
(A) DNA polymerase (B) DNA dependent RNA polymerase
(C) RNA dependent RNA polymerase (D) poly A synthetase.

接背面

23. Point mutation at:
（A）promotor（B）polyadenylation site（C）intron（D）exon
of a genome will cause the change of amino acid residue in gene product, protein.

24. One isolated a full-length mRNA with 1000 nucleotides which could encode a protein with a molecular weight (MW) of:
（A）240,000（B）120,000（C）60,000（D）30,000

25. Which of the following codon is a chain terminating codon?
(A)AUG（B）UAG（C）UGA（D）AAG

26. What is the end product of amino acid –N metabolism in man.
(A) glucose (B) lactic acid (C) pyruvic acid (D) urea

27. Ubiquitin is (A) an amino acid (B) a polypeptide (C) a sugar (D) a lipid

28. Which one is an aromatic amino acid: (A) Ala (B) Gly (C) Val (D) Tyr

29. Argininosuccinic acid is (A) an amino acid (B) a protein (C) a sugar
(D) a fatty acid

30. Hemoglobin contains (A) Cu (B)Mg (C)Mn (D) Fe ion.

31. Which of the following statements is <u>true</u> ?

(A) A principle action of insulin in adipose tissue is to activate the activity of hormone sensitive lipase.

(B) Production of malonyl-CoA from acetyl-CoA is the controlling step in fatty acid synthesis, this reaction has a reqirement for NADPH as cofactor.

(C) Both phospholipids and apo C-II are required as cofactors for lipoprotein lipase.

(D) Leukotrienes and lipoxins are formed by the cyclooxygenase pathway.

32. The C20:4, $\triangle^{5,8,11,14}$ fatty acid can be synthesized from

(A) C16:1, $\triangle^{9}$ (B) C18:1, $\triangle^{9}$ (C) C18:2, $\triangle^{9,12}$ (D) C18:3, $\triangle^{9,12,15}$

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33. Elongation of fatty acid chains occurs in

(A) nucleus (B) endoplasmic reticulum (C) mitochondria (D) lysosome

34. Which of the following is the ligand for chylomicron remnant receptor?

(A) apo A-I (B) apo B-100 (C) apo B-48 (D) apo E

35. Which of the following is inhibitor of cholesterol 7α-hydroxylase?

(A) cholesterol (B) mevalonate (C) bile acid (D) vitamin C

36. Which one of the following sugars in the diet disappears from the blood of diabetic patient at a normal rate:
(A) D-fructose (B) D-glucose (C) starch (D) lactose.

37. Please point out which amino-acid residue is possibly covalently linked to the glycan moiety of a glycoprotein molecule:
(A) Trp (B) Arg (C) Asn (D) Lys.

38. Which one of the following hormones that does not tend to elevate the blood glucose level:
(A) glucagon (B) epinephrine (C) growth hormone (D) insulin

39. Which one of the followings is more likely not the feature of cancer:
(A) aging (B) telomere elongation (C) uncontrolled cell growth
(D) mutation in p53 gene.

40. What is the most likely outcome of a human cell exposed to a tumor promoter:
(A) cancer (B) DNA damage (C) kinase activation (D) mutation.