

臺北醫學大學九十學年度研究所碩士班招生考試題目卷

九十學年度研究所碩士班招生筆試

科目：生物化學

所別：醫研、生材、細分

考科：生物化學

題目試卷共 2 張，本試卷為第 1 張

I. Choose the right answer. (40%).

- () 1. What is the term describing cellular membrane structure, according to which the proteins are embedded in a phospholipid bilayer and are free to move in the plane of the membrane? (a) induced fit, (b) fluid mosaic model, (c) chemiosmotic coupling, (d) lock-and-key hypothesis
- () 2. (a) LDL, (b) VLDL, (c) HDL, (d) VHDL is a type of lipoprotein particle that functions mainly to distribute cholesterol from the liver to other tissues. Its protein component consists of a single molecule of apoprotein B-100.
- () 3. (a) Prokaryotes, (b) Eukaryotes, (c) Virus, (d) Bacteria is a type organisms whose cells are compartmentalized by internal cellular membranes to produce a nucleus and organelles.
- () 4. Reactive oxygen species do not include (a) superoxide, (b) peroxide, (c) hydroxyl radical, (d) alanine.
- () 5. Retroviruses possess reverse transcriptase. After the virus infects a cell, this enzyme transcribes the RNA genome into a _____ version, which integrates into a host chromosome. (a) double-strand RNA, (b) single-strand RNA, (c) double-strand DNA, (d) single-strand DNA
- () 6. (a) CPR, (b) PCR, (c) PRC, (d) RFLP is a technique that is used to amplify the number of copies of a specific DNA sequence through repeated cycles of denaturation and replication.
- () 7. (a) Eastern, (b) Western, (c) Southern, (d) Northern blotting is a technique for identifying proteins or protein fragments in a mixture that reacts with a particular antibody. The mixture is first resolved into bands by one-dimensional denaturing gel electrophoresis. The protein bands are then blotted onto a membrane sheet, the sheet is treated with the antibody, and any bands that bind the antibody are identified.
- () 8. (a) Active site, (b) Regulatory site, (c) Allosteric site, (d) Ligand binding site is the site on an enzyme molecule where the substrate binds and where the reaction is facilitated. It is often a cleft or pocket in the surface of the enzyme.
- () 9. (a) Ligands, (b) Gyases, (c) Histones, (d) Proteasomes are the proteins that participate in forming the nucleosomal structure of chromatin. Four of the five kinds of the proteins make up the core particle of the nucleosome; the fifth is associated with the linker DNA between nucleosomes. All these proteins are small very basic proteins.
- () 10. (a) Phosphorylase, (b) Protein kinase C, (c) Pheromone, (d) Cyclin is the protein that regulates the cell cycle by binding to and activating specific nuclear protein kinases. Kinase activations occur at three points during the cell cycle, thus providing three decision points as to whether the cell cycle will proceed.
- () 11. (a) Cytoplasm, (b) Nucleus, (c) Mitochondria, (d) Cytoskeleton is an organized network of rodlike and fiberlike proteins that pervades a cell and helps give it its shape and mobility. It includes actin filaments, microtubules, and a diverse group of filamentous proteins collectively called intermediate filaments.
- () 12. (a) Erythrocyte, (b) Hybridoma, (c) Adipocyte, (d) Macrophage is cultured cell line that is made by fusing antibody-producing B lymphocytes with cells derived from a mouse myeloma (a type of lymphocyte cancer). Like B cells, it produce specific antibodies, and like myeloma, it can proliferate independently in culture.
- () 13. (a) Proenzymes, (b) Allosteric enzymes, (c) Isozymes, (d) Chaperonins are different but related forms of an enzyme that catalyze the same reaction. Often differ in only a few amino acids substitutions.
- () 14. Which is a nucleotide analog serving as chain terminators in DNA sequencing? (a) 2',3'-dideoxyadenosine triphosphate, (b) deoxyuridine monophosphate, (c) deoxythymidine, (d) 2,4-dinitrophenol
- () 15. (a) DNA polymerases, (b) Restriction enzymes, (c) Topoisomerases, (d) DNA gyases are the enzymes that change the supercoiling of DNA helices by either allowing the superhelical torsion to relax (thus reducing the supercoiling) or adding more twists (thus increasing the supercoiling).
- () 16. (a) Glucogenic, (b) Glycogenolysis, (c) Gluconeogenesis, (d) Glycolysis is the initial pathway in the catabolism of carbohydrates, by which a molecule of glucose is broken down to two molecules of pyruvate, with the net production of ATP and NADH.

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考試時間：90分鐘

題目試卷共 2 張，本試卷為第 2 張

- () 17. Which is not the property of enzyme? (a) decrease of activation energy, (b) can be used over and over again, (c) change equilibrium constant, (d) no effect on the overall free energy change
- () 18. Penicillin reacts with the active site of glycoprotein peptidase in a manner of _____ inhibition. (a) mixed noncompetitive, (b) irreversible, (c) competitive, (d) uncompetitive
- () 19. Which one is an aromatic amino acid? (a) proline, (b) tyrosine, (c) cysteine, (d) glutamine
- () 20. What are not the major biosynthetic reaction that utilize PRPP? (a) phosphoribosylamine in the de novo pathway of purine formation, (b) purine nucleotides from free bases by the salvage pathway, (c) orotidylate in the formation of pyrimidines, (d) biosynthesis of ornithine from glutamate

II. Define the following terms: (20%)

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| 1. apoptosis | 2. attenuation |
| 3. electrophoresis | 4. melting temperature (T_m) |
| 5. isoelectrical point (pI) | 6. allosteric enzymes |
| 7. heterotrophs | 8. heterozygous |
| 9. plus strand | 10. domain |

III. Calculate the yield of ATP when 1 mole of sucrose is completely metabolized *via* anaerobic glycolysis with hydrolytic cleavage into lactate. (10%)

IV. What is the significance of k_{cat} , k_M , and k_{cat}/K_M in a Michaelis-Menten reaction? (10%)

V. Describe the physiological role of any vitamin involving in the metabolism of oxidoreduction or electron transfer. (10%)

VI. What is an operator? promoter? enhancer sequence? repressor? and transcription factor? (10%)