

# 國立高雄師範大學九十七學年度碩士班招生考試試題

系所別：科學教育研究所

科目：生物學（共 3 頁，第 1 頁）

一、Please define the specific terms following as: (50%)

- (1) Eukaryotic cell
- (2) DNA topoisomerase
- (3) Endocrine
- (4) Retrotransposon
- (5) Ecological succession
- (6) Meiosis
- (7) Cell cycle
- (8) Vascular tissue system in plant
- (9) Glomerulus
- (10) Receptor and ligand

二、選擇題（單選題，每題 2%）

1. Which of the following represents the smallest functional unit of living organisms?  
A. atoms                                      B. molecules                                      C. proteins  
D. water                                        E. salt
2. Which of the statements about the synthesis of polypeptides (proteins) is INCORRECT?  
A. Translation is the process of protein synthesis.  
B. Proteins are synthesized in the cytosol.  
C. The synthesis of proteins is a catabolic process.  
D. The synthesis of proteins requires ribosomes.  
E. Proteins are synthesized from mRNA template.
3. Which of the following structure or molecular machine is important for protein degradation in eukaryotes?  
A. cytoskeleton                                B. flagellum                                      C. ribosome  
D. ATP synthase                                E. proteasome
4. Which of the following is NOT a product of the light reaction?  
A. NADPH                                        B. ATP    C. oxygen  
D. carbon dioxide                                E. energy intermediates
5. Which of the following forms a protective layer outside of the plasma membrane of the plant cell?  
A. cell wall                                        B. cellulose                                        C. chitin  
D. pectin    E. proteoglycans
6. Which protein influences the ability of RNA polymerase to transcribe genes?  
A. DNA polymerases                            B. DNA helicases                                C. transcription factors  
D. snRNPs                                        E. Trna

（背面有題）

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科目：生物學（共 3 頁，第 2 頁）

7. Which of the following CANNOT be repaired by nucleotide excision repair (NER)?
- A. ultraviolet-induced damage
  - B. chemically modified bases
  - C. missing bases
  - D. mismatched bases
  - E. pyrimidine dimmers
8. An organism that is heterozygous for two traits can produce a maximum of \_\_\_\_\_ different gametes for these traits.
- A. 2
  - B. 4
  - C. 2; if they are on the same chromosome
  - D. 4; *only* if they are on different chromosomes
  - E. 8
9. A bacterial cell must have \_\_\_\_\_ in order to transfer portions of its chromosome to another cell.
- A. an F factor
  - B. a high frequency of combination plasmid
  - C. a recombination factor
  - D. growth enhancement genes
  - E. all of these components
10. Which of the following blotting techniques allows a researcher to determine the number of copies of a gene within the genome of an organism?
- A. Western blotting
  - B. colony hybridization
  - C. Northern blotting
  - D. Southern blotting
  - E. Eastern blotting
11. The early Earth atmosphere is thought to have lacked which of the following gases?
- A. N<sub>2</sub>
  - B. O<sub>2</sub>
  - C. CO<sub>2</sub>
  - D. H<sub>2</sub>O
12. Blue flower color (*B* allele) is dominant to white (*b* allele). In a population, white flowers (*bb*) occur at a frequency of 0.16. What frequency of the population is heterozygous (*Bb*)?
- A. 0.84 or 84%
  - B. 0.68 or 68%
  - C. 0.48 or 48%
  - D. 0.24 or 24%
13. The field of biology concerned with classifying organisms and viruses is
- A. evolution.
  - B. phylogeny.
  - C. taxonomy.
  - D. nomenclature.
14. Amoebae are characterized by:
- A. locomotion by extension of pseudopodia
  - B. possession of hard shells
  - C. tertiary symbiosis
  - D. causing cancer
  - E. conjugation
15. A tracheid is:
- A. a gametophyte cell
  - B. a small branch of an insect trachea
  - C. a seed-bearing stem
  - D. a specialized vascular cell
  - E. a reproductive chamber
16. Animal classification has undergone a reassessment in recent years because of:
- A. Carl Linnaeus' new data
  - B. comparisons of DNA and rRNA among different taxa
  - C. new, genetically engineered species
  - D. developing resistance to antibiotics
  - E. all of the choices provided

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17. Reptiles are better adapted to life on land than are amphibians. Which of the following statements best describes their advantage?
- A. Reptiles have an egg with an amnion, yolk sac, allantois, chorion, and shell.
  - B. Reptiles have a skin that resists loss of water by evaporation.
  - C. Reptiles breathe by expanding the rib cage.
  - D. Reptiles have the ability to concentrate urine.
  - E. All the other choices provided are correct.
18. Measurement of relative water content (RWC) can be used to predict a:
- A. plant's ability to recover from cell collapsing
  - B. wilted condition
  - C. need for fertilizers
  - D. cold shock
  - E. salt tolerance
19. Which of the major tissue types has shortening of cells (i.e., contraction) as its major function?
- A. nervous
  - B. muscular
  - C. epithelial
  - D. connective
  - E. All of the choices are correct
20. Birds store food in a modified portion of the lower esophagus called the
- A. crop.
  - B. epiglottis.
  - C. gizzard.
  - D. alimentary canal.
  - E. pharynx.
21. Which part of the neuron is responsible for receiving information?
- A. axon
  - B. dendrite
  - C. soma
  - D. nucleus
  - E. axon hillock
22. The most important cause of global warming is production of anthropogenic
- A. carbon monoxide.
  - B. CO<sub>2</sub>.
  - C. oxygen.
  - D. phosphorus.
  - E. NO<sub>3</sub>.
23. The study of how populations grow and what promotes and limits population growth is
- A. Population Ecology.
  - B. Growth Ecology.
  - C. Demography.
  - D. Growth Ecology and Demography.
  - E. Disease Ecology
24. An assemblage of many populations that live in the same place at the same time is called a
- A. cabal.
  - B. community.
  - C. population
  - D. demograph.
  - E. cabal and population.
25. Biological diversity can be measured at three levels
- A. genetic diversity, species diversity, and ecosystem diversity.
  - B. ecosystem diversity, species diversity, and process diversity.
  - C. species diversity, function diversity, and process diversity.
  - D. ecosystem diversity, genetic diversity, and species diversity.
  - E. None of these choices are correct.