

※ 注意：請於試卷內之「非選擇題作答區」作答，並應註明作答之題號。

配合題與單選題 (共 25 題、每題 4 分)

1-8. Match the most appropriate answer

The founder effect is mainly due to (1)

(2) is a phenomenon for evolution to occur in the same habitat.

The metabolic rate of an animal is measured by the consumption of (3)

(4) is taken by the body by active transport.

Pepsinogen is secreted by (5)

The shift in oxygen-hemoglobin dissociation curve due to pH and temperature is called (6)

The blood flow between baby and mother in the placenta fits (7)

The B and T cell receptors anchor to plasma membrane by (8)

A. Allopatric speciation	H. Oxygen
B. Sympatric speciation	I. Urea
C. Chief Cell	J. Glucose
D. Genetic drift	K. Bohr effect
E. Pancrea	L. Transmembrane domain
F. Countercurrent effect	M. Immunoglobulin
G. Nature Selection	N. Trade-off

9-12. Match the most appropriate answer

(9) are ion channels that open and close in response to changes in the membrane voltage.

(10) is a kind of the neurotransmitters that is released between neuromuscular junction.

(11) is a kind of the chemical messengers that is released by the kidney when oxygen levels are low, which stimulates red blood cell production in the bone marrow to increase tissue oxygenation.

(12) is a hormone that is released from the hypothalamus and regulates ACTH secretion into the bloodstream.

A. Voltage-gated channels	F. Neurotransmitters
B. erythropoietin	G. ligand-gated ion channels
C. Corticotropin-releasing hormone	H. hemoglobin
D. cortisol	I. summation
E. epinephrine	J. acetylcholine

見背面

Questions 13-15

After a coastal storm 3 deer mice (*Peromyscus*), huddled on a tree trunk, are carried several miles out to sea and wash ashore on a small island that has no mice, but can certainly support them. Deer mice eat seeds, primarily. The island has one side covered with decomposed black lava and ash, and black sands from an ancient volcano; the rest of the island has typical desert vegetation and white sandy beaches. The entire island has lots of plants and places for mice to live. There are small ground nesting birds, hawks, and a variety of lizards living on the island. Two of the mice are female, and they both mate with the male.

()13. Many thousands of years pass. Someone coming to the island might find

- A. a population of very dark mice
- B. a population of very light mice
- C. two populations of mice, one light and one dark, that seldom interbreed
- D. a population of mice that interbreeds but has a lot of phenotypic variation in coat color

()14. Although it was a rare trait in the mainland population, one of the original female mice is homozygous for very large ears. This will lead to a population with a higher incidence of big ears than the mainland population because of

- A. bottleneck effect
- B. founder effect
- C. mutation
- D. genetic drift

()15. At least some of the requirements for a Hardy-Weinberg equilibrium would be in effect on the island. For instance there is probably

- A. high rates of emigration
- B. very large population size
- C. no immigration
- D. no mutation

()16. A restriction in genetic variability caused by a drastic reduction in population size is called a

- A. founder effect
- B. Hardy-Weinberg effect
- C. bottleneck effect
- D. polymorphic effect

- ()17. Fungi are ecologically important because of all of the following except
- A. they break down organic material and return them to the ecosystem
 - B. all can exist in symbiotic relationships
 - C. some can ferment and produce bread, beer, wine, cheese, and soy sauce
 - D. they can break down lignin
- ()18. Select the mismatched endocrine gland and its hormone from the choices below.
- A. adrenal cortex—aldosterone
 - B. pancreas—insulin
 - C. pineal gland—melatonin
 - D. adrenal medulla—estrogen
- ()19. Structures which are derived from the same body part in a common ancestor but may have different appearances and functions are called
- A. analogous structures
 - B. homologous structures
 - C. vestigial structures
 - D. embryonic structures
- ()20. In bacteria, fungi, and plants the high internal pressure generated by osmosis is counteracted by the mechanical strength of their
- A. cell walls
 - B. organelles
 - C. cytoskeletons
 - D. plasma membranes
- ()21. Which of the following is common to both cellular respiration and the light reactions of photosynthesis?
- A. the transfer of electrons to glucose
 - B. the chemiosmotic formation of ATP
 - C. oxygen is one of the byproducts
 - D. mitochondria are essential organelles

見背面

- ()22. A cell biologist is conducting a karyotype procedure on alligator red blood cells. Exactly what does this mean?
- A. It means that red blood cells from the alligator will be examined with a microscope and the nuclei will be counted.
 - B. It means that red blood cells from the alligator will be examined using restriction enzymes to count the number of centromeres that are present on the chromosomes.
 - C. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope, photographed, counted, lined up with their respective homologous partner, and displayed.
 - D. It means that chromosomes from the red blood cells of the alligator will be examined with a microscope to determine the amount of hemoglobin present.
- ()23. Sometimes one gene pair will interact so as to control the expression of a second gene pair in an interaction called
- A. epistasis
 - B. gene regulation
 - C. dominance
 - D. pleiotropy
- ()24. *Agrobacterium* cannot be used in genetic engineering procedures conducted on cereals such as corn, rice, and wheat because
- A. it does not infect these types of plants
 - B. it does not contain the correct restriction enzymes necessary for insertion
 - C. its plasmids have been altered to be used only in broadleaf plants
 - D. it interferes with the nitrogen fixing capabilities of narrow leaf plants
- ()25. Which of the following features are common to both moss leaves and true leaves?
- A. vascular strands
 - B. appear green
 - C. all the cells are haploid
 - D. except at the midrib only one cell thick

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