

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
護一	普 生	許之勤	93 年 1 月 15 日第 1 節		

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台北醫學大學九十二學年度護理學系一年級
 第一學期「普通生物學」期末考試題目

一、單選題 (15%，每題 1.5 分)

- Which of the following statement is false: (1) Natural selection simply is the differences in survival and reproduction among individuals, (2) Natural selection results in modifications of traits within a line of descent, (3) Natural selection leads to a continuing adaptation of a species to its environment, (4) Evolution can occur only by way of mutation.
- Microevolution means that changes have occurred in a population's: (1) alleles frequencies, (2) habit, (3) behavior, (4) characteristics, over time.
- Allele frequencies cannot change through: (1) mutation, (2) genetic drift and gene flow, (3) natural selection, (4) aging.
- A change in allele frequencies brought about by the physical movement of alleles into and out of a population is called: (1) natural selection, (2) genetic drift, (3) gene flow, (4) genetic exchange.
- An incompatibility between body parts of potential mates or pollinators is a form of: (1) prezygotic isolation, (2) temporal isolation, (3) mechanical isolation, (4) behavioral isolation.
- The study of structures that appear during the development of different organisms, called: (1) biogeography; (2) comparative anatomy; (3) comparative embryology; (4) molecular biology.
- The first living cells were: (1) yeast; (2) algae; (3) bacteria; (4) fungi.
- The: (1) H_2O ; (2) N_2 ; (3) O_2 ; (4) CO_2 ; was a key selection pressure in the evolution of eukaryotic cells.
- Random change in the frequencies of alleles in a population is called: (1) gene flow; (2) polymorphism; (3) natural selection; (4) genetic drift.
- Match the following to the description: "random change in the gene pool that occurs in a small colony". : (1) mutation; (2) bottleneck effect; (3) gene flow; (4) founder effect.

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ECOLOGY

Two points for each question

- _____ The behavior, which reduces an individual's fitness while increasing the fitness of a recipient, is known as (a) altruism. (b) courtship ritual. (c) dominance hierarchy. (d) imprinting. (e) optimal foraging.
- _____ A place where an organism lives is called (a) biodiversity. (b) biome. (c) biosphere. (d) habitat. (e) territory.
- _____ The main photosynthesizers in the ocean are (a) corals. (b) fish. (c) phytoplankton. (d) killer whales. (e) zooplankton.
- _____ The area flooded by high tides and left dry during low tides is called (a) aphotic zone. (b) benthic zone. (c) intertidal zone. (d) pelagic zone. (e) photic zone.
- _____ Which biome is the driest of all terrestrial regions? (a) chaparral (b) coniferous forest (c) dessert (d) savannas (d) tundra
- _____ Which biome is dominated by cone-bearing evergreen trees? (a) chaparral (b) coniferous forest (c) dessert (d) savannas (d) tundra
- _____ The bird spreads all over North America from 120 to 100,000,000 individuals is (a) cuckoo. (b) graylag goose. (c) loon. (d) love bird. (e) starling.
- _____ Of the following factors with the potential to limit the growth of a natural population, which one is density-dependent? (a) a limited amount of food (b) fire (c) flood (d) snow (e) typhoon
- _____ In a population, the number of individuals that an environment can sustain is called (a) biomass. (b) biodiversity. (c) carrying capacity. (d) competitive exclusion. (e) sustainable development..
- _____ The gray tree frog can blend into its surroundings by turning shades of gray, brown, or green and is usually hard to spot, because of (a) Batesian mimicry. (b) camouflage. (c) imitation. (d) imprinting. (e) Müllerian mimicry.
- _____ How many eggs does a female European cuckoo lay in the host's nest? (a) 1 (b) 2 (c) 3 (d) 4 (e) 5
- _____ The learning that limited to a sensitive time period in an animal's life and generally irreversible is (a) habituation. (b) innate behavior. (c) innovation. (d) imitation. (e) imprinting.
- _____ The "peck order" among hens is a kind of (a) cognition. (b) courtship ritual. (c) dominance hierarchy. (d) optimal foraging. (e) reciprocal altruism.
- _____ The route of bee's waggle dance, indicating both distance and direction of food, looks like a shape of (a) —. (b) ~. (c) S. (d) ∞. (e) ○.
- _____ The species found nowhere else are (a) biological crisis. (b) biodiversity. (c) endangered species. (d) endemic species. (e) threatened species.

臺北醫學大學 92 學年度第 一 學期 期中考試 (命題) 題紙

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
護一	普 生	陳淑慧	93年1月15日第1節		

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MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. Two points for each question

Please write down your answers in the following table.

1.	2.	3.	4.	5.	6.	7.	8.
9.	10.	11.	12.	13.	14.	15.	16.
17.	18.	19.	20.	21.	22.	23.	24.
25.	26.	27.	28.				

- Which of the following is an example of countercurrent flow?
 - the flow of air within the primary bronchi of a human and the flow of blood within the pulmonary veins
 - the flow of water across the skin of a frog and the flow of blood within the ventricle of its heart
 - the flow of fluid out of the arterial end of a capillary and the flow of fluid back into the venous end of that same capillary
 - the flow of water across the gills of a fish and the flow of blood within those gills
 - the flow of blood in the dorsal vessel of an insect and the flow of air within its tracheae
- Which of the following statements about humoral immunity is *correct*?
 - It primarily defends against fungi and protozoa.
 - It primarily defends against bacteria and viruses that have already infected cells.
 - It protects the body against cells that become cancerous.
 - It is mounted by lymphocytes that have matured in the bone marrow.
 - It is responsible for transplant tissue rejection.
- Each indication below is a clinical characteristic of inflammation *except*
 - redness.
 - pain.
 - edema.
 - increased blood flow.
 - decreased temperature.
- Which of the following vitamins is *incorrectly* associated with its use?
 - vitamin C = synthesis of connective tissue
 - vitamin E = protection of membrane phospholipids from oxidation
 - vitamin D = calcium absorption and bone formation
 - vitamin A = incorporation into the visual pigment of the eye
 - vitamin K = production of red blood cells

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- 5) All of the following statements about antibodies are true *except*:
 - A) Plasma B cells are responsible for the production of antibodies.
 - B) Antibodies bind with foreign cells and destroy them.
 - C) Antibodies are immunoglobulin proteins.
 - D) Antibodies act as signals to blood complement proteins or phagocytes.
 - E) The structure of antibodies includes both a constant and a variable region.
- 6) Which of the following is an example of positive feedback in the immune system?
 - A) Cells release a cytokine that stimulates these cells to divide and release more of the cytokine.
 - B) Memory cells proliferate and produce antibodies.
 - C) Large antigens with many repeating antigenic determinant sites can stimulate B cells without the aid of T cells.
 - D) Cytotoxic cells release substances that attract macrophages.
 - E) Both A and B are examples of positive feedback in the immune system.
- 7) Which of the following fibers is responsible for the resistant property of tendons?
 - A) collagenous fibers
 - B) elastin fibers
 - C) spindle fibers
 - D) fibrin fibers
 - E) reticular fibers
- 8) Which of the following is true of interstitial fluid?
 - A) It forms the extracellular matrix of connective tissue.
 - B) It is found inside the small intestine.
 - C) It provides for the exchange of materials between blood and cells.
 - D) It is the internal environment found in animal cells.
 - E) It is composed of blood.
- 9) All of the following are functions of the mammalian kidney *except*
 - A) production of urea as a waste product of protein catabolism.
 - B) water reabsorption.
 - C) filtration of blood.
 - D) regulation of salt balance in the blood.
 - E) excretion of nitrogenous waste.
- 10) Most of the carbon dioxide carried by the blood in humans is carried as
 - A) carbonic acid in the erythrocytes.
 - B) bicarbonate attached to hemoglobin.
 - C) CO₂ attached to hemoglobin.
 - D) CO₂ dissolved in the plasma.
 - E) bicarbonate ions in the plasma.

臺北醫學大學 92 學年度第 一 學期 期中 考試 (試) 題紙

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- 11) If, during protein starvation, the osmotic pressure on the venous side of capillary beds drops below the hydrostatic pressure, then
- most carbon dioxide will be bound to hemoglobin and carried away from tissues.
 - hemoglobin will not release oxygen.
 - fluids will tend to accumulate in tissues.
 - the pH of the interstitial fluids will increase.
 - plasma proteins will escape through the endothelium of the capillaries.
- 12) Which of the following is an example of positive feedback?
- An increase in blood sugar concentration increases the amount of the hormone that stores sugar as glycogen.
 - A decrease in blood sugar concentration increases the amount of the hormone that converts glycogen to glucose.
 - An increase in calcium concentration increases the amount of the hormone that stores calcium in bone.
 - A decrease in calcium concentration increases the amount of the hormone that releases calcium from bone.
 - An infant's suckling at the mother's breast increases the amount of the hormone that induces the release of milk from the mammary glands.
- 13) Human plasma proteins include which of the following?
- fibrinogen
 - hemoglobin
 - immunoglobulin
- I only
 - II only
 - I and III only
 - II and III only
 - I, II, and III
- 14) Which of the following characteristics of blood best explains its classification as connective tissue?
- It contains more than one type of cell.
 - It is contained in vessels that "connect" different parts of an organism's body.
 - Its cells can move from place to place.
 - It is found within all the organs of the body.
 - Its cells are widely dispersed and surrounded by a fluid.
- 15) Countercurrent exchange in the fish gill helps to maximize
- endocytosis.
 - active transport.
 - blood pressure.
 - osmosis.
 - diffusion.

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16) A patient reports severe symptoms of watery, itchy eyes and sneezing after being given a flower bouquet as a birthday gift. A reasonable initial treatment would involve the use of

- A) sterile pollen.
- B) a vaccine.
- C) antihistamines.
- D) monoclonal antibodies.
- E) complement.

17) Which of the following participates in both the specific and nonspecific defense systems of the body?

- A) pyrogens
- B) complement
- C) macrophages
- D) B cells
- E) Both B and C are correct.

18) Cardiac muscle is

- A) smooth and involuntary.
- B) striated and unbranched.
- C) striated and voluntary.
- D) striated and branched.
- E) smooth and voluntary.

19) Cows are able to survive on a diet consisting almost entirely of cellulose because

- A) the cow's saliva has enzymes capable of digesting cellulose.
- B) cows are autotrophic.
- C) cows have cellulose-digesting, symbiotic microorganisms in their rumens.
- D) the cow, like the rabbit, reingests its feces.
- E) cows can manufacture all 15 amino acids out of sugars in the liver.

20) Which of the following tissues lines the kidney ducts?

- A) epithelial
- B) connective
- C) adipose
- D) smooth muscle
- E) nervous

21) Which example best describes a homeostatic control system?

- A) The kidneys excrete salt into the urine when dietary salt levels rise.
- B) A blood cell shrinks when placed in a solution of salt and water.
- C) The blood pressure increases in response to an increase in blood volume.
- D) Motility in the digestive tract increases following a meal.
- E) The core body temperature of a runner is allowed to gradually rise from 37°C to 45°C.

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- 22) If a molecule of CO_2 released into the blood in your left toe travels out of your nose, it must pass through all of the following structures *except*
- A) right ventricle.
 - B) right atrium.
 - C) alveolus.
 - D) trachea.
 - E) pulmonary vein.
- 23) What is complement?
- A) a form of interferon
 - B) a specialized white blood cell
 - C) a set of antigens
 - D) a hormone from the thymus
 - E) a group of proteins
- 24) What is the reason that fluid is forced out of systemic capillaries at the arteriolar end?
- A) The osmotic pressure of the interstitial fluid is greater than that of the blood.
 - B) The hydrostatic pressure of the blood is less than that of the interstitial fluid.
 - C) The hydrostatic pressure of the blood is greater than the osmotic pressure of the interstitial fluid.
 - D) The osmotic pressure of the blood is greater than the hydrostatic pressure of the interstitial fluid.
 - E) The osmotic pressure of the interstitial fluid is greater than the hydrostatic pressure of the blood.
- 25) A patient has a blood pressure of 120/75, a pulse rate of 40 beats/min, a stroke volume of 70 ml/beat, and a respiratory rate of 25 breaths/min. This person's cardiac output per minute will be
- A) 1000 ml. B) 500 ml. C) 1750 ml. D) 2800 ml. E) 4800 ml.

Refer to Figure 44.2, a diagram of a renal tubule, to answer the following questions.

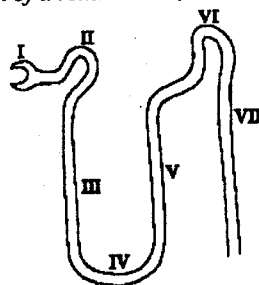


Figure 44.2

- 26) In which region would urine become more concentrated?
- A) I B) III C) IV D) V E) VII

臺北醫學大學 92 學年度第 一 學期 期中 考試 (試) 命題紙

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- 27) Which one of the following statements is not true?
- A) Many herbivorous animals have cellulose-digesting microbes in their colon and cecum.
 - B) A tadpole's intestines are shorter, relative to the body size, than an adult frog's intestines.
 - C) Prokaryotes in the colon and cecum digest plant material.
 - D) We expect that an herbivore will have a longer alimentary canal than a carnivore of similar body size.
 - E) Rumination helps to soften and break down plant fibers, making them more accessible to digestion by microbes.
- 28) The main function of a gizzard is to
- A) moisten food.
 - B) store food.
 - C) absorb nutrients.
 - D) grind food.
 - E) digest vitamins.