

私立臺北醫學院八十九學年度第 一 學期 ~~期中~~ 考試 (試) 題紙

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
保公護	普通生物學	李惠春	90年1月18日第2節		

※①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
 ②每張試題卷務必填寫(學號)、(姓名)。

- An *alimentary canal* is best defined as
 - the compartment in which an animal digests its food.
 - a digestive cavity in which food is churned and mixed.
 - a tube-shaped digestive compartment with either one or two openings.
 - a tube-shaped digestive compartment that has two openings and through which food moves in one direction.
 - a tube-shaped digestive compartment that has two openings and consists minimum of a mouth, esophagus, stomach, intestine and anus.
- A human requires hundreds of grams (克) of carbohydrates every day. The daily requirement for most vitamins is in the milligram (毫克) range. Why are vitamins needed in such small quantities (量)?
 - Vitamins are not very important in metabolism
 - The energy content of vitamins is so great that you don't need much.
 - Vitamins are reusable.
 - The body can store large quantities of most vitamins.
 - Every cell needs carbohydrates, but only a few need vitamins.
- Animals that use their body surface for gas exchange must
 - be aquatic.
 - have a high ratio of body surface area to volume.
 - have a low ratio of body surface area to volume.
 - be aquatic and nearly spherical (圓球型).
 - have a special kind of hemoglobin.
- Countercurrent exchange* in the gills of a fish
 - speeds up the flow of water through the gills
 - interferes (干擾) with the efficient absorption of oxygen
 - maintains a gradient that enhances (加強) diffusion
 - means that blood and water flow in the same direction
 - enables (促使) the fish to obtain oxygen while swimming backward (向後).
- In an *open circulatory system*,
 - there is no heart.
 - there is no blood.
 - there are no blood vessels.
 - blood flows out of the body.
 - blood flows between cells.
- Which of the following is the biggest difference between your cardiovascular system and the cardiovascular system of a fish?
 - Yours is a closed system; the fish's is an open system.
 - Your heart chambers are called atria and ventricles.
 - Your circulation has two circuits; fish circulation has one circuit.
 - Your heart has two chambers; a fish heart has four.
 - In a fish, blood is oxygenated by passing through a capillary bed.
- Which of the following is not an immediate function of *histamine*?
 - causing local blood vessels to dilate.
 - causing local blood vessels to become leakier.
 - increasing blood flow to the area.
 - increasing systemic blood pressure
 - causing local swelling of the tissue.
- Which of the following is *not* part of the body's *nonspecific defense system*?
 - Macrophages
 - antibodies
 - interferons
 - complement proteins
 - inflammation

教務處公佈專用

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
保公護	普通生物學	李惠春	90年1月18日第2節		

※①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
②每張試題卷務必填寫(學號)、(姓名)。

9. ____ In each nephron of the kidney, the *glomerulus* and *Bowman's capsule*
- refine and concentrate the urine for excretion
 - filter the blood and capture the filtrate
 - reabsorb salts and nutrients
 - reabsorb water into the blood
 - break down harmful (有害的) toxins (毒素) and poisons.
10. ____ Birds and insects excrete uric acid, while mammals and amphibians excrete mainly urea. What is the chief (主要的) advantage of uric acid over urea as a waste product?
- Uric acid is more soluble in water.
 - Uric acid is a much simpler molecule.
 - It takes less energy to make uric acid.
 - Less water is lost excreting uric acid.
 - More solutes are lost excreting uric acid.
11. ____ A cell that is affected by a particular steroid hormone would be expected (預期) to have ____
- DNA sites that interact with the hormone.
 - an intracellular receptor protein that binds the hormone.
 - a cell-surface receptor protein that binds the hormone.
 - enzymes that are activated or inactivated by the intracellular hormone-receptor complex.
 - enzyme that are activated or inactivated by the hormone's second messenger.
12. ____ What is the function of a *sperm cell's acrosome*?
- It contains the sperm's nucleus and is the part of the sperm that enters the egg during fertilization.
 - It fuses with the plasma membrane of the egg cell.
 - It contains enzymes that are released when the sperm encounters an egg and dissolves a hole in the egg's jelly coat.
 - It contains the fuel that powers the sperm.
 - It contains the sperm's helical mitochondrion.
13. ____ Where do developing sperm cells undergo *meiosis*?
- In the epididymis.
 - In the vas deferens.
 - In the seminal vesicle.
 - In the wall of the seminiferous tubules.
 - In the seminiferous tubule lumen.
14. ____ A woman had several miscarriages (流產). Her doctor suspected (懷疑) that a hormonal insufficiency (缺乏) was causing the lining of the uterus to break down, as it does during menstruation, terminating (終止) her pregnancies (懷孕). Treatment with which of the following might help her remain pregnant?
- oxytocin
 - follicle-stimulating hormone
 - testosterone
 - luteinizing hormone
 - prolactin
15. ____ Suppose (假設) a researcher carefully removes (去除) the myelin sheath from the axon of a neuron. The most likely result would be that this neuron would
- no longer be able to produce neurotransmitters
 - be much more sensitive to stimuli
 - be much less sensitive to stimuli
 - transmit nerve signals more rapidly
 - transmit nerve signals more slowly

私立臺北醫學院八十九學年度第一學期~~期中~~考試(試)題紙

系級	科目	授課教師	考試日期	學號	姓名
公保預	普通生物學	李惠春	90年1月18日第2節		

※①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
②每張試題卷務必填寫(學號)、(姓名)。

16. How do action potentials relay *different intensities of information*?
 - a. by changing in amplitude relative to the strength of the stimulus
 - b. by changing in frequency relative to the strength of the stimulus
 - c. by changing in speed of travel relative to the strength of the stimulus
 - d. by changing in duration relative to the strength of the stimulus
 - e. by changing in shape relative to the strength of the stimulus
17. Which of the following statements about transmission across a typical *chemical synapse* is *not* true?
 - a. Neurotransmitter molecules are stored in vesicles in the synaptic knob.
 - b. Action potentials trigger chemical changes that make the neurotransmitter vesicles fuse with the plasma membrane of the transmitting cell.
 - c. Vesicles containing neurotransmitter diffuse to the receiving cell's plasma membrane.
 - d. Neurotransmitter molecules bind to receptors in the receiving cell's plasma membrane.
 - e. The binding of neurotransmitter to receptors opens ion channels in the membrane of the receiving cell.
18. *Osteoporosis* is most common in
 - a. Young women.
 - b. Teenage males.
 - c. Women after menopause.
 - d. Men over the age of 65.
 - e. Men with an autoimmune disease.
19. Functionally, what is the muscle fiber's fundamental *unit of contraction*?
 - a. thick filament
 - b. thin filament
 - c. myofibril
 - d. sarcomere
 - e. Z line
20. During muscle contraction, within a *sarcomere* the
 - a. Thin filaments get thicker.
 - b. Thick filaments move closer together.
 - c. Z lines move closer together.
 - d. Thick filaments get thicker.
 - e. Z lines move closer to the plasma membrane.

21. Match each of the following components (成分) of blood with what happens to it as the blood is processed by the kidney.

- | | |
|-------------------|--|
| 1. water | a. passes into filtrate; partially reabsorbed; excreted in urine |
| 2. glucose | b. remains in blood |
| 3. plasma protein | c. passes into filtrate, mostly reabsorbed |
| 4. urea | d. passes into filtrate; also secreted; excreted in urine |
| 5. red blood cell | |

22. Tracing the path of an oxygen molecule from the air to a muscle cell in your arm, naming all the structures involved along the way. 從下表中選出號碼依序排列，不一定所有名詞都用到。

(1) alveolus, (2) aorta, (3) artery, (4) arteriole, (5) atrium, (6) bronchus, (7) bronchiole, (8) enter capillaries in lung, (9) coronary artery, (10) bind hemoglobin, (11) nose, (12) pharynx, (13) pulmonary artery, (14) pulmonary vein, (15) enter red blood cell, (16) trachea, (17) vein, (18) ventricle, (19) venule.

11 (nose) → → 4 (arteriole) in arm
muscle → dissociate from hemoglobin → leave red blood cell → leave blood vessel → through interstitial fluid → enter muscle cells.

私立臺北醫學院 八十九 學年度第 一 學期 期中 考試 (命 試) 題紙

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
公保護	普通生物學	李惠春	90年1月18日第2節		

※①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
 ②每張試題卷務必填寫(學號)、(姓名)。

23. Anesthetics (麻醉或止痛劑) block (阻擋) pain by blocking the transmission of nerve signals. Which of these three chemicals might work as anesthetics? Please explain your answer. 請說明下面三種藥品是否能作為止痛劑(可以或不可以), 並簡單說明原因或機制(一個句子即可)。

I. a chemical that prevents the opening of sodium channels in membranes

II. a chemical that inhibits the enzymes that degrade (分解) neurotransmitters

III. a chemical that blocks neurotransmitter receptors

24. Due to countercurrent flow in gills, a fish can remove about 80% of the oxygen dissolved in the water flowing through the gills. What would be the maximum percentage of the water's oxygen a gill could extract if its blood flowed *in the same direction* as the water instead of counter to it? Explain your answer. 在魚鰓中, 假設水與血液是同方向流動, 最多可萃取出多少水中含氧量? 請簡單加以說明, 可繪圖。

收
品
部
用

25. Juan has a disease in which damaged kidneys allow some of his normal plasma proteins to be removed from the blood. One of the symptoms of this kidney malfunction is an accumulation of excess interstitial fluid, which causes Juan's arms and legs to swell. How might this condition affect the *osmotic pressure of blood in capillaries*, compared to the *surrounding interstitial fluid*? Can you explain why this occurs? 黃先生患有腎臟疾病, 導致正常的血漿蛋白從腎流失, 而有手、腳腫脹的病徵(過多的組織液屯積)。在微血管處體液受血壓及滲透壓影響而進、出血管, 請就此點來解釋黃先生四肢腫脹的現象。

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
公保護 一	生物學	林	90年1月18日第2節		

*①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
②每張試題卷務必填寫(學號)、(姓名)。

教務處
公佈專用

ECOLOGY

- _____ A place where an organism lives is called (生物棲住之處稱為) (a) biodiversity. (b) biome. (c) biosphere. (d) habitat. (e) territory.
- _____ Which biome is a region of dense, spiny shrubs with tough, evergreen leaves? (何種生物區之主要植被為：具有堅韌、常綠樹葉的密生灌木) (a) chaparral (b) coniferous forest (c) dessert (d) savannas (d) tundra
- _____ Of the following factors with the potential to limit growth of a natural populations, which one is density-dependent? (在下列限制族群成長的因子中，何種為 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 (在一族群中，環境所能維持的最多個體數稱為) (a) biomass. (b) biodiversity. (c) carrying capacity. (d) competitive exclusion. (e) sustainable development..
- _____ A population with an equilibrial life history (具有 equilibrial life history 的族群) (a) is controlled by density-independent factors (受 density-independent factors 所控制). (b) lives in an unpredictable environment (存活於不可預期的環境中) (c) produces few offspring (產生較少的子代). (d) reproduces when young (性早熟). (e) tends to grow exponentially (呈指數成長).
- _____ A "niche" is (a) a group of interacting individuals of a particular species (源自於同一種類、具有交互作用的一群生物). (b) a population's role in its community, or the appropriate combination of conditions for a species to thrive. (一族群在其群聚中所扮演的角色；或最適合某種生物生長的最佳環境因子組成). (c) an area that individuals defend and from which other members of the same species usually excluded (某生物個體為了防禦或排斥同種生物而界定出的地域範圍). (d) an interaction between two or more species in which one species lives in or on another species (兩種或多種生物共同生活的交互作用). (e) an interaction where one species eats another (某種生物捕食另一種生物的交互作用).
- _____ 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 (灰樹蛙能隨環境背景而改變體色，以致難以辨認，是因為牠們具有以下何種能力) (a) Batesian mimicry. (b) camouflage. (c) imitation. (d) imprinting. (e) Müllerian mimicry.

私立臺北醫學院八十九學年度第一學期~~期中~~考試(試)題紙

系 級	科 目	授 課 教 師	考 試 日 期	學 號	姓 名
公衛教	普通生物學	林	90年1月18日第2節		

※①請注意本試題共 6 張。如發現頁數不足及空白頁或缺印，應當場請求補齊，否則缺少部份概以零分計。
 ②每張試題卷務必填寫(學號)、(姓名)。

- _____ The European cuckoo's egg-lying behavior is out of (歐洲布穀鳥的產卵行為是源自於) (a) habituation. (b) innate behavior. (c) innovation. (d) imitation. (e) imprinting.
- _____ The "peck order" among hens is a kind of (母雞群中的 peck order 是一種) (a) cognition. (b) courtship ritual. (c) dominance hierarchy. (d) optimal foraging. (e) reciprocal altruism.
- _____ What kind of material will damage the O₃ layer? (何種物質會破壞 O₃ layer) (a) CFCs (b) CO₂ (c) DDT (d) FAPs (e) PVC

教務處公佈專用