

臺北醫學大學 九十二學年度第 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
醫 技	普通生物學	楊良友	92年1月15日第 一 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
Medical Technology**

Fall 2003

Instructor: Dr. Liang-Yo Yang

**MULTIPLE CHOICE.** There are 55 multiple choice questions in this exam and each question is worth 2 points. Choose the **ONE AND ONLY ONE** alternative that best completes the statement or answers the question. **Please remember to write down your name and student ID on at least the first page and the last page of this exam. Please write down your answer in the table provided on the page 10.** I wish you all do well in the final exam. Have a great Chinese New Year and enjoy your winter break.

- 1) Geckos are able to walk up walls and across ceilings because of the
  - A) None of the choices are correct.
  - B) sticky saliva licked onto the regions where the gecko is about to walk.
  - C) many setae on the gecko's toes that form molecular bonds with the surface.
  - D) little suction cups on their toes.
  - E) sticky adhesive secretions on their feet.
  
- 2) Which of the following is not an example of how structural adaptations give a bird its ability to fly?
  - A) Interlocking barbules make the feathers strong.
  - B) The bird wing has more bones than the human arm.
  - C) Feathers are produced by special pits in the bird's skin.
  - D) The weight of flight muscles is largely kept off the wings.
  - E) Many of the wing bones are hollow but are reinforced internally with trusses.
  
- 3) Structure in the living world is organized at hierarchical levels. Which of the following choices lists several of these, from least inclusive to most inclusive?
  - A) molecule, cell, tissue, organ, organ system, organism
  - B) cell, molecule, organ, organ system, tissue, organism
  - C) molecule, cell, organ, organ system, tissue, organism
  - D) cell, molecule, tissue, organ, organ system, organism
  - E) molecule, cell, tissue, organ system, organ, organism
  
- 4) A stratified squamous epithelium is found in the
  - A) brain. B) kidney. C) liver. D) esophagus. E) heart.
  
- 5) Which of the following is not a type of connective tissue?
  - A) cartilage B) blood C) bone D) plasma E) fat
  
- 6) Connective tissue is different from the other major tissue types in that
  - A) it is not made up of cells.

臺北醫學大學 九十二學年度第一學期 期中 考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技	普通生物學	楊良友	92年 1月 15日 第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003

Instructor: Dr. Liang-Yo Yang

- B) the cells are sparsely scattered through a nonliving matrix.  
 C) it is made up of cells.  
 D) it is found only in humans.  
 E) it has no essential function in an animal's body.
- 7) Which of the following is not true of a typical skeletal muscle?  
 A) It can be enlarged by exercise.  
 B) It can be contracted at will.  
 C) It is attached to bones by tendons.  
 D) Its fibers have a striped appearance under the microscope.  
 E) Its individual cells can sustain contractions longer than smooth muscle cells can.
- 8) Which of the following is not a true statement about organs?  
 A) An organ consists of many cells.  
 B) An organ consists of several tissues.  
 C) An organ represents a higher level of structure than the tissues composing it.  
 D) An organ can only carry out the functions of its component tissues.  
 E) Organs are found in virtually all animals except sponges.
- 9) Which of the following imaging techniques is best suited for visualizing fine anatomic detail in the brain?  
 A) X-ray tomography  
 B) computerized tomography  
 C) positron-emission tomography  
 D) X-ray imaging  
 E) magnetic resonance imaging
- 10) Which of the following imaging techniques makes it possible to see which areas of the brain are active during particular types of mental activity?  
 A) X-ray tomography  
 B) computerized tomography  
 C) magnetic resonance imaging  
 D) X-ray imaging  
 E) positron-emission tomography
- 11) What happens to nutrient macromolecules in an animal's digestive tract?  
 A) The digestive breakdown of macromolecules is keyed to the body's need for monomers; only the monomers that are immediately needed are produced.  
 B) They are absorbed whole and are broken down to monomers in the cells that ultimately use

臺北醫學大學 九十二學年度第一學期 期中考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技一	普通生物學	楊良友	93年 1 月 15 日 第 一 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology  
 them.**

Fall 2003

Instructor: Dr. Liang-Yo Yang

- C) All nutrient macromolecules are digested to monomers before absorption.
- D) Nucleic acids and triglycerides (which diffuse across the plasma membrane) are not digested to monomers; other macromolecules are.
- E) Proteins and nucleic acids are digested to monomers before absorption; energy-storage macromolecules (starch and fat) are absorbed whole.

12) The main function of a gizzard is to

- A) grind food. B) absorb nutrients. C) store food. D) digest vitamins. E) moisten food.

13) Which of the following choices lists the organs of the bird digestive system in the correct order?

- A) esophagus, crop, gizzard, stomach, intestine, anus
- B) esophagus, stomach, gizzard, crop, intestine, anus
- C) esophagus, gizzard, crop, stomach, intestine, anus
- D) esophagus, crop, stomach, gizzard, intestine, anus
- E) esophagus, gizzard, stomach, crop, intestine, anus

14) The tongue does all of the following except

- A) push food into the pharynx.
- B) manipulate food.
- C) taste food.
- D) secrete saliva.
- E) shape food into a bolus.

15) Which of the following is the usual cause of heartburn?

- A) reflux of acid chyme from the stomach into the lower esophagus
- B) compression of the lower esophagus by an overfilled stomach
- C) retention of food at the bottom of the esophagus by a sphincter that is reluctant to open
- D) irritation of the lower esophagus by substances in spicy food
- E) secretion of acid by the lining of the lower esophagus

16) The parietal cells of the stomach's gastric glands secrete

- A) mucus. B) pepsinogen. C) lactic acid. D) pepsin. E) hydrochloric acid.

17) When the wall of the stomach fails to protect itself from digestion, the result is

- A) a duodenal ulcer. B) heartburn. C) a gastric ulcer. D) nausea. E) reverse peristalsis.

18) Which of the following nutrients does not begin undergoing digestion until it reaches the

臺北醫學大學 九十二學年度第一學期 期中考試 (命題) 題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技	普生	楊良友	93年 1月 15日 第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam**                      **Fall 2003**                      **Instructor: Dr. Liang-Yo Yang**  
**Medical Technology**  
 small intestine?

A) fat   B) polypeptide   C) starch   D) complex carbohydrate   E) protein

19) Altogether, the body secretes about 7 liters of water into the alimentary canal each day.

About what percentage of this water gets reabsorbed?

A) 30% B) 90% C) 40% D) 50% E) 75%

20) Which one of the following statements is not true?

- A) Many herbivorous animals have cellulose-digesting microbes in their colon and cecum.
- B) Rumination helps to soften and break down plant fibers, making them more accessible to digestion by microbes.
- C) Prokaryotes in the colon and cecum digest plant material.
- D) A tadpole's intestines are shorter, relative to the body size, than an adult frog's intestines.
- E) We expect that an herbivore will have a longer alimentary canal than a carnivore of similar body size.

21) High-flying birds are able to obtain enough oxygen even when the air is very thin for all of the following reasons except that

- A) they have a very large number of capillaries in their flight muscles.
- B) they have hemoglobin with a higher affinity for oxygen than other vertebrates.
- C) they have more efficient lungs than other vertebrates.
- D) their flight muscles have a special protein that stores a ready supply of oxygen.
- E) their mitochondria are more efficient than those of other vertebrates.

22) If you were to move from sea level to high altitude, your body would respond with all of the following adaptations except a(n)

- A) increase in the diameter and number of capillaries.
- B) increase in the affinity of hemoglobin for oxygen.
- C) increase in the rate and depth of breathing.
- D) faster heart rate.
- E) increase in the number of red blood cells.

23) Animals that use their body surface for gas exchange must

- A) have a low ratio of body surface area to volume.
- B) be aquatic and nearly spherical.
- C) have a high ratio of body surface area to volume.
- D) have a special kind of hemoglobin.
- E) be aquatic.

臺北醫學大學 九十二學年度第一學期 期中考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技	普生	楊良友	93年1月15日第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003 Instructor: Dr. Liang-Yo Yang

- 24) Gills are generally unsuitable for animals living on land because
- A) gills require too high a blood pressure.
  - B) the wet surfaces tend to stick together and collapse when exposed to air.
  - C) there is no way to get air into the gills.
  - D) gills do not function well in animals that have a diaphragm.
  - E) air cannot diffuse across the gill surface.
- 25) The organization of blood and water flow in a fish's gills increases the fish's ability to extract oxygen from the water because
- A) water flows in two directions over the gills, once during inhalation and again past the gills during exhalation.
  - B) the deoxygenated blood entering a gill lamella encounters deoxygenated water first.
  - C) the deoxygenated blood entering a gill lamella encounters oxygenated water first.
  - D) the thick blood vessels in the gills bring very large amounts of blood.
  - E) None of the choices are correct.
- 26) The chief advantage of exchanging gases in water is that
- A) less energy is required to ventilate gills than lungs.
  - B) no energy need be expended to keep the exchange surface wet.
  - C) carbon dioxide is easier to eliminate in water than in air.
  - D) water can contain more oxygen than air.
  - E) the contact between the respiratory surface and the gas-containing medium is more intimate in water than in air.
- 27) Which of the following statements is not true?
- A) The main problem facing any air-breathing animal is the loss of water to the air by evaporation.
  - B) The circulatory system of insects is not involved in transporting oxygen.
  - C) A terrestrial animal spends much more energy than an aquatic animal ventilating its respiratory surface.
  - D) Insects lose very little water by using a tracheal system.
  - E) The tracheal system of insects consists of a series of branching air tubes that extend from the surface to deep inside the body.
- 28) Which of the following choices lists the correct path of carbon dioxide moving out from the interior of the body?
- A) alveoli, trachea, bronchioles, bronchi, pharynx, larynx
  - B) alveoli, bronchioles, bronchi, trachea, pharynx, larynx
  - C) alveoli, bronchi, bronchioles, trachea, larynx, pharynx
  - D) alveoli, bronchi, bronchioles, trachea, pharynx, larynx

臺北醫學大學 九十二 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
醫技	普生	楊良友	93年1月15日第 節		

\* ①請注意本試題共 十 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)。

Biology Final Exam                      Fall 2003                      Instructor: Dr. Liang-Yo Yang  
 Medical Technology

E) alveoli, bronchioles, bronchi, trachea, larynx, pharynx

29) Which of the following components of the respiratory system does not have a ciliated surface covered by a thin film of mucus?

- A) major bronchioles    B) midsized to small bronchioles    C) alveoli    D) trachea    E) bronchi

30) Which of the following statements is not true about inhalation in birds?

- A) Both the anterior and posterior sacs expand.  
 B) The anterior sac fills with air, and the posterior sacs empty.  
 C) The lungs fill with air from the posterior sacs.  
 D) The anterior sacs fill with stale air from the lungs.  
 E) Both the anterior and posterior sacs fill with air.

31) Most spinal cord damage is caused by

- A) viral infections.  
 B) slicing of the spinal cord.  
 C) bacterial infections.  
 D) forces that pull the cord apart.  
 E) bleeding, swelling, and scarring after an injury.

32) Multiple sclerosis primarily involves

- A) deterioration of the corpus callosum.  
 B) deterioration of parts of the spinal cord.  
 C) destruction of the myelin sheath.  
 D) destruction of the hippocampus.  
 E) destruction of regions of the motor cortex.

33) Which of the following statements is not true of the resting potential?

- A) The cell membrane is much more permeable to sodium than to potassium.  
 B) The concentration of sodium is much higher inside the cell than outside it.  
 C) The concentration of potassium is much higher inside the cell than outside it.  
 D) Most of the proteins dissolved in the cell's cytoplasm are negatively charged.  
 E) Large organic molecules do not diffuse out of the cell.

34) Which of the following statements about the sodium-potassium pump is not true?

- A) It moves equal amounts of sodium and potassium across the membrane.  
 B) If it stopped working, much of the membrane potential would dissipate.  
 C) It keeps the concentration of sodium low inside the cell.  
 D) It actively transports potassium into the cell.

臺北醫學大學 九十二學年度第一學期 期中考試 (命題) 題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技	普生	楊良友	93年1月15日第 節		

\*①請注意本試題共十張。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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003

Instructor: Dr. Liang-Yo Yang

E) It is a membrane protein.

35) How do action potentials relay different intensities of information?

- A) by changing in shape relative to the strength of the stimulus
- B) by changing in frequency relative to the strength of the stimulus
- C) by changing in amplitude relative to the strength of the stimulus
- D) by changing in speed of travel relative to the strength of the stimulus
- E) by changing in duration relative to the strength of the stimulus

36) Which of the following statements about transmission across a typical chemical synapse is not true?

- A) Action potentials trigger chemical changes that make the neurotransmitter vesicles fuse with the plasma membrane of the transmitting cell.
- B) Neurotransmitter molecules are stored in vesicles in the synaptic knob.
- C) Vesicles containing neurotransmitter diffuse to the receiving cell's plasma membrane.
- D) The binding of neurotransmitter to receptors opens ion channels in the membrane of the receiving cell.
- E) Neurotransmitter molecules bind to receptors in the receiving cell's plasma membrane.

37) Consider a nerve cell body in the brain that receives input from many synaptic knobs of different kinds. Which of the following statements about this system is not true?

- A) The closer a synapse is to the receiving cell's axon, the stronger will be the signal it delivers.
- B) Neurotransmitters alter the membrane potential of the receiving cell by entering it through membrane channels.
- C) The more neurotransmitter molecules that bind to receptors on the receiving cell, the stronger will be the resulting signal.
- D) Depending on the neuron, a given neurotransmitter can be either excitatory or inhibitory.
- E) Neurotransmitter molecules that open sodium channels make the receiving cell more likely to fire.

38) Which of the following neurotransmitters is associated with sleep, mood, attention, and learning?

- A) epinephrine B) acetylcholine C) endorphins D) GABA E) serotonin

39) Which of the following effects could result from activation of the sympathetic nervous system?

- A) decreased heart rate
- B) decreased rate of digestion
- C) decreased rate of breathing

臺北醫學大學 九十二學年度第一學期 期中考試 (試) 命題紙

系級	科目	目	授課教師	考試日期	學號	姓名
醫技	普生		楊良友	92年1月15日第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003

Instructor: Dr. Liang-Yo Yang

- D) decreased blood pressure
- E) constriction of the bronchi

40) Which parts of the human brain are responsible for control of breathing?

- A) basal ganglia and corpus callosum
- B) medulla oblongata and pons
- C) cerebrum and cerebellum
- D) thalamus and hypothalamus
- E) hippocampus and amygdala

41) How are hormones distributed to tissues, and what determines which cells a hormone will affect?

- A) They are carried to specific organs by lymphatic vessels and affect the cells in those organs.
- B) They are carried to specific organs by ducts and affect the cells in those organs.
- C) They are distributed locally in the interstitial fluid and affect nearby responsive target cells.
- D) They are delivered by neurosecretory cells to specific tissues and cells, which are affected.
- E) They are carried throughout the body in the bloodstream, and each hormone affects the target cells responsive to it.

42) Compared to the endocrine system, the nervous system

- A) has a slower response with a longer lasting signal.
- B) has a faster response but the signal does not last as long.
- C) has a slower response and a signal that does not last as long.
- D) has a faster response with a longer lasting signal.
- E) has a similar response with a stronger signal

43) Which of the following endocrine glands is actually part of the brain?

- A) thymus B) thyroid C) pineal D) parathyroid E) adrenal cortex

44) Which of the following choices does not pair an endocrine gland or hormone with an aspect of metabolism that it regulates?

- A) ovary female sexual characteristics
- B) parathyroid blood calcium levels
- C) pancreas blood glucose levels
- D) insulin blood glucose levels
- E) prolactin blood potassium levels

45) Which of the following is not an endocrine gland?

- A) pituitary gland B) salivary gland C) thyroid gland D) testes E) pancreas



臺北醫學大學 九十二學年度第一學期 期中考試 (命題) 題紙

系 級 科 目	授 課 教 師	考 試 日 期	學 號	姓 名
醫 技 普 生	楊 良 友	93年 1 月 15 日 第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003 Instructor: Dr. Liang-Yo Yang

- 46) Which one of the following statements is not true?  
 A) The pituitary is the master control center of the entire endocrine system.  
 B) The posterior pituitary is composed of nervous tissue.  
 C) Inhibiting hormones make the anterior pituitary stop secreting hormones.  
 D) Releasing hormones make the anterior pituitary secrete hormones.  
 E) The anterior pituitary is composed of nonnervous, glandular tissue.
- 47) Which gland requires the element iodine to produce its hormones?  
 A) ovary B) thyroid C) pituitary D) adrenal medulla E) pineal
- 48) Which of the following may be a consequence of excessive secretion of parathyroid hormone?  
 A) gigantism  
 B) loss of calcium from the blood  
 C) exhaustion of the immune system  
 D) convulsive contractions of skeletal muscles  
 E) loss of calcium from the bone
- 49) Which of the following best describes the relationship of insulin to glucagon?  
 A) They work together to prepare the body to deal with stress.  
 B) High levels of insulin inhibit pancreatic secretion of glucagon.  
 C) Insulin stimulates the pancreas to secrete glucagon.  
 D) Insulin is a steroid hormone; glucagon is a protein hormone.  
 E) They are antagonistic hormones.
- 50) Which of the following glands secretes hormones that enable the body to respond to stress?  
 A) parathyroid B) pancreas C) pineal D) salivary E) adrenal

ECOLOGY

- 51) An area with an exceptional concentration of species and a large number of endangered and threatened species is called (A) biodiversity hot spot. (B) biome. (C) coniferous forest. (D) intertidal zone. (E) niche.
- 52) Of the following factors with the potential to influence the distribution of a natural population, which one is biotic factor? (A) air. (B) predator. (C) solar energy. (D) temperature. (E) water.
- 53) The bird that 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.

臺北醫學大學 九十二學年度第一學期 期中考試 (試) 命題紙

系級	科目	授課教師	考試日期	學號	姓名
醫技一	普生	楊良友	92年1月15日第 節		

\*①請注意本試題共 十 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)。

**Biology Final Exam  
 Medical Technology**

Fall 2003 Instructor: Dr. Liang-Yo Yang

- 54) In which a palatable or harmless species that mimics an unpalatable or harmful model is called (A) Batesian mimicry. (B) camouflage. (C) imitation. (D) imprinting. (E) Müllerian mimicry.
- 55) The symbiotic relationship, in which one partner benefits without significantly affecting the other, is known as (A) commensalism. (B) competition. (C) mutualism. (D) parasitism. (E) predation.

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.	29.	30.
31.	32.	33.	34.	35.	36.	37.	38.	39.	40.
41.	42.	43.	44.	45.	46.	47.	48.	49.	50.
51.	52.	53.	54.	55.					