

Choose the best answer for question.

1) When tracing the path of filtrates, the loop of the nephron follows which structure ?

- a glomerular capsule
- b proximal convoluted tubule
- c distal convoluted tubule
- d glomerulus
- e collecting duct

2) Which of these hormones is most likely to directly cause a drop in blood pressure?

- a aldosterone
- b antidiuretic hormone
- c erythropoietin
- d atrial natriuretic hormone
- e renin

3) The function of erythropoietin is

- a reabsorption of sodium ions
- b excretion of potassium ions
- c reabsorption of water
- d to stimulate red blood cell production
- e to increase blood pressure

4) Which of the following materials would not normally be filtered from the blood at the glomerulus ?

- a water
- b glucose
- c urea
- d protein
- e sodium ions

5) Which of the following is a structural difference between the urinary systems of males and females ?

- a Males have a shorter urethra than females.
- b In males, the urethra passes through the prostate.
- c In females, the urethra serves both the urinary and reproductive systems.

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問1. bacteria と viruses について正しい記述を3つ選べ。

- A. bacteria, viruses とともに遺伝物質は DNA である。
- B. ヒトに感染した場合、bacteria は細胞外に存在し、virus は細胞内に存在する。
- C. 多くの bacteria は自立的に移動できるが、virus は出来ない。
- D. bacteria は細胞分裂によって増殖するが、virus はしない。
- E. bacteria, viruses とともに光学顕微鏡で観察できる。
- F. 全ての bacteria, viruses が病原性をもつわけではない。

問2. 以下の文章のカッコ内に適当な語句を入れよ。語句は下の語群から選べ。

体内に進入した病原体はまず血液中を循環している白血球の一種である(1)や組織のマクロファージによって貪食され、これらの細胞の中で殺菌される。病原体の侵入に対して、組織に常在する細胞である(2)はヒスタミンなどを産生し、血管の拡張、透過性の上昇、白血球の浸潤を誘導し、発赤、発熱、腫脹などを特徴とする生体反応、いわゆる(3)が引き起こされる。引き続き獲得免疫系による生体防御が機能し始めるが、この防御機構は、(4)と呼ばれる血液細胞によって担われる。この血液細胞の主なものにはT細胞とB細胞があり、後者はプラズマ細胞に分化し、(5)と呼ばれる生体防御に必須なタンパク質を産生する。全ての血球細胞は骨髄中の造血幹細胞に由来するが、T細胞は(6)と呼ばれる器官に依存的に産生され、この細胞の先天的な欠損は重篤な(7)の原因となる。

- a) allergy, b) antibody, c) antigen, d) autoimmune disease, e) erythrocytes,
- f) immunodeficiency, g) inflammation, h) interferon, i) lymphocytes, j) lymph nodes, k) mast cells, l) neutrophils, m) thymus, n) vaccine

問1						
問2	1:	2:	3:	4:	5:	6:
						7:

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In questions 1—5, choose the most suitable description.

1. During ventricular diastole,
 - a. blood flows into the aorta.
 - b. the ventricles contract.
 - c. the semilunar valves are closed.
 - d. Both a and b are correct.
2. When the atria contract, the blood flows
 - a. into the attached blood vessels.
 - b. into the ventricles.
 - c. through the atrioventricular valves.
 - d. to the lungs.
 - e. Both b and c are correct.
3. Heart valves located at the bases of the pulmonary trunk and aorta are called
 - a. atrioventricular valves.
 - b. semilunar valves.
 - c. mitral valves.
 - d. chordae tendineae.
4. Which of these associations is mismatched?
 - a. left ventricle—aorta
 - b. right ventricle—pulmonary trunk
 - c. right atrium—vena cava
 - d. left atrium—pulmonary artery
 - e. Both b and c are incorrectly matched.
5. Which statement is not correct concerning the heartbeat?
 - a. The atria contract at the same time.
 - b. The ventricles relax at the same time.
 - c. The AV valves open at the same time.
 - d. The semilunar valves open at the same time.
 - e. First the right side contracts; then the left side contracts.

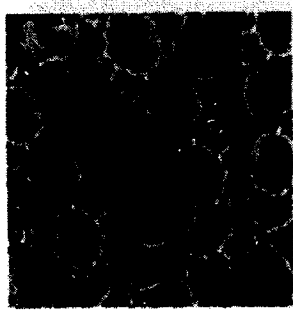
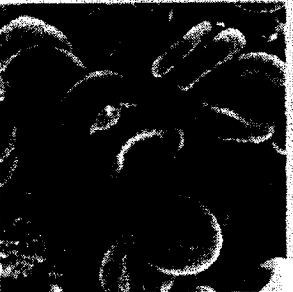
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1、以下のうち、間違いを含んでいる文の番号(3つ)を右に書け。 () () ()

- ①. Most human cells are about $1\mu\text{m}$ in diameter, about the width of a human hair.
- ②. The eukaryotic cell is believed to have evolved from the archaea.
- ③. Chromatin can coil tightly to form visible chromosomes during meiosis and mitosis.
- ④. Enzymes have a specific region, called an anchor site, where the substrates are brought together so they can react.
- ⑤. In the cytoskeleton, actin filaments are much larger than microtubules.
- ⑥. Cilia and flagella are involved in movement

2、次の括弧内に適切な語を下の語群から選んで括弧内に書け(同一番号は同じ単語)

- The plasma membrane is a (①) bilayer. The (①) bilayer is (②) permeable, which means it allows certain molecules — but not others — to enter the cell. Proteins scattered throughout the plasma membrane play important roles in allowing substances to enter the cell. All types of cells also contain cytoplasm, which is a semifluid medium that contains (③) and various types of molecules suspended or dissolved in the medium. The presence of proteins accounts for the semifluid nature of the cytoplasm. The cytoplasm contains (④). Originally the term (④) referred to only membranous structures, but we will use it to include any well-defined subcellular structure.



(⑤) solution (same solute concentration as in cell)	(⑥) solution (lower solute concentration than in cell)	(⑦) solution (higher solute concentration than in cell)
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Glycolysis is termed (⑧), because it requires no oxygen. This pathway can occur in (⑨) that live in bogs or swamps or our intestinal tract. During glycolysis, hydrogens and electrons are removed from (⑩), and (⑪) results. The breaking of bonds releases enough energy for a net yield of two (⑫) molecules.

語群 : cholesterol, plasmalipid, protein(s), water, phospholipid, alcohol, organelle(s), glycolipid, actively, absolutely, selectively, negatively, supertonic, hypertonic, lowertonic, hypotonic, isotonic, neutral, acidic, basic, aerobic, anaerobic, plants, microbes, viruses, ATP, RNA, NADH, NAD, HAD, ADP, glycogen, glucose, pyruvate

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正しければ○を、間違っていれば×を、() に記入しなさい。

- (1) Muscular tissue moves the body and its parts. (、)
- (2) Red blood cells function in helping to seal injured blood vessels. ()
- (3) Smooth muscle has striated cells. () (4) Cardiac muscle is voluntary. ()
- (5) The thoracic cavity contains the heart and lungs. ()
- (6) The respiratory system exchanges gases at lungs. ()
- (7) The skeletal system produces heat. () (8) Exocrine glands secrete hormones. ()
- (9) Adhesion junctions allow materials to pass from cell to cell. ()
- (10) Melanoma is extremely serious. () (11) Sweat glands secrete sebum. ()
- (12) The ovaries produce sex cells called eggs. ()
- (13) Tendons connect bones to other bones at joints. ()
- (14) Negative feedback allows rapid change in one direction. ()
- (15) The dermis is made up of stratified squamous epithelium. ()
- (16) The integumentary system synthesizes vitamin D. ()
- (17) The respiratory system removes oxygen from the body at the lungs. ()
- (18) The reproductive system has different organs in the male and female. ()
- (19) The skeletal system produces blood cells within red bone marrow. ()
- (20) White blood cells fight infections. ()

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最も適切な単語を word bank から選び、括弧内に記載せよ。

1. The typical tissue layers of the wall of the digestive tract are mucosa, submucosa, (), and serosa.
2. A rhythmic contraction called () pushes the food along the esophagus and continues in all the organs of the digestive tract.
3. The stomach churns foods with () gastric juice.
4. The large surface area of the small intestine facilitates absorption of () into the cardiovascular and lymphatic system.
5. The large intestine consists of cecum, colon, (), and anal canal.
6. The pancreas has both an () and an exocrine function.
7. The liver produces bile, which is stored in the ().
8. () is stored by the liver in the form of glycogen.
9. Adequate protein formation requires 20 different types of amino acids. Of these, 8 are required from the diet. These are termed the () amino acids.
10. There are 13 vitamins, which are divided into groups. One is fat-soluble vitamins and the other is ()-soluble vitamins.

<Word bank>

glucose, acidic, nutrients, muscularis, gallbladder, water, rectum, peristalsis, endocrine, essential

<注> churn : かき回す

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Indicate true (T) or false (F).

- (1) Erythropoietin is important for red blood cell production.
- (2) Red blood cells transport oxygen.
- (3) Neutrophils respond to an infection.
- (4) When a blood clot occurs, fibrinogen is converted to fibrin.
- (5) A person with type A blood has anti-A antibodies in the plasma.
- (6) Megakaryocytes produce neutrophils.
- (7) Leukemia is defined when the blood has too few red blood cells and/or not enough hemoglobin.
- (8) T lymphocytes protect human by producing antibodies.
- (9) Hemolysis is the destruction of red blood cells.
- (10) Hemophilia is an inherited clotting disease due to a deficiency in a clotting factor.

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|-----|-----|-----|-----|------|
| (1) | (2) | (3) | (4) | (5) |
| (6) | (7) | (8) | (9) | (10) |