

國立臺灣大學九十六學年度轉學生入學考試試題

題號：50

科目：普通動物學

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※ 注意：請於試卷上「選擇題作答區」依序作答。

一、選擇題 I (20%):

1. 下列物質不是由基本單位串聯而成的聚合物？(A) DNA (B) protein (C) starch (D) lipid
2. 下列何項是造就 PCR (polymerase chain reaction) 技術成功開發的主要關鍵？
(A) understanding double-helix of DNA (C) enhancing DNA sequencing technique
(B) understanding DNA synthetic mechanism (D) discovering heat-stable DNA polymerase
3. 正常成人身體單位體積(cm^3)，何種細胞密度最低？
(A) erythrocytes (C) neurons
(B) sperms (D) leucocytes
4. 下列有關染色體的敘述，何者正確？
(A) Semi-conservation occurs during chromosome duplication.
(B) Gene is a short RNA sequence in a chromosome.
(C) A chromosome consists of proteins, nucleotides and lipids.
(D) During meiosis, the cell divides twice, and its chromosomes duplicate once.
5. 下列有關 DNA 的特性，何者錯誤？
(A) double-helix structures
(B) The basic structure of DNA consists of bases, deoxyriboses, and phosphates.
(C) The bases of DNA include adenine, guanine, cytosine, and thymine.
(D) The ladder-like main structure of DNA is formed by nitrate and sugar.
6. 成人心臟內的任一瓣膜 1 分鐘開關約 70 次，試問一顆心臟 1 天內所有瓣膜開關約
(A) 100,000 times (B) 200,000 times
(C) 300,000 times (D) 400,000 times
7. 預防接種如天花疫苗一生只打一次，有的如肝炎疫苗要打 3-4 次，這是因為
(A) the difference between active immunity and passive immunity (B) individual difference
(C) the capacity of antibody induction (D) the stability of vaccine
8. 過敏反應與下列何者無關？(A) antibody (B) histamine (C) lymphocytes (D) interferon
9. 下列有關發炎反應的敘述，何者錯誤？
(A) an immune disorder (C) occurrence within minutes or hours
(B) non-specific immuno-responses (D) redness, swollen, heat, and pain
10. 人體除了胰島素外，還有哪一賀爾蒙直接與血糖調控有關？(A) epinephrine (B) glucagon (C) secretin
(D) androgen

二、選擇題 II (60%):

1. Most signal molecules
(A) are activated by receptors. (C) are secreted by target cells.
(B) can pass through the plasma membrane. (D) rarely enter the cytosol of a target cell.
2. The following groups present correct match except
(A) Lung – stratified squamous epithelium. (C) Urinary bladder – stratified columnar epithelium.
(B) Intestine – simple columnar epithelium. (D) Loop of Henle – simple cuboidal epithelium.
3. Which of the following match is incorrect?
(A) vitamin A – DNA synthesis (C) vitamin D - calcium absorption
(B) vitamin B - Coenzyme. (D) vitamin K – blood clotting.

接背面

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4. The correct sequence of human intestine is
(A) duodenum → ileum → jejunum → colon → cecum → rectum.
(B) duodenum → jejunum → ileum → colon → cecum → rectum.
(C) duodenum → jejunum → colon → ileum → cecum → rectum.
(D) duodenum → jejunum → ileum → cecum → colon → rectum.
5. The main function of liver in human include all of the following except
(A) synthesis of bile. (C) detoxification of urea.
(B) storage of glycogen. (D) production of plasma proteins.
6. A RBC is in an artery of intestine of a man. How many capillary beds must this cell pass through before it returns to the left ventricle of the heart?
(A) one. (C) three.
(B) two. (D) four.
7. Which of the following statement about human lung ventilation is correct?
(A) The contraction of alveoli can ventilate the lung.
(B) We use the ribs and diaphragm to perform negative pressure breathing.
(C) The vital capacity of our lung is equal to tidal volume plus residual volume.
(D) We can close our mouth to make positive pressure breathing, which forces air down the trachea.
8. All of the following statements about clonal selection are correct except
(A) Each lymphocyte's specificity for an antigen is determined after selection.
(B) Each lymphocyte recognizes and responds to only one antigenic determinant.
(C) Each selected lymphocyte is activated to divide and differentiate forming effector cells and memory cells.
(D) Each antigen determinant selectively activates single clone of cell from the body's diverse pool of lymphocytes.
9. Which of the following pairing is correct?
(A) interferon – cytotoxic T cells. (C) immunoglobulin – helper T cells.
(B) perforin – natural killer cells. (D) interleukin I – antigen presenting cells.
10. Theoretically, an AIDS patient should not suffer from
(A) anaphylactic shock. (C) common cold.
(B) hemophilia. (D) rheumatoid arthritis.
11. Which of the following items is not involved into circadian rhythms in human?
(A) superchiasmatic nuclei. (C) pineal gland.
(B) visual cortex (D) melatonin.
12. Prolactin participates the following life phenomena except
(A) metamorphosis in frogs. (C) fat metabolism and reproduction in birds.
(B) mammary gland growth in women. (D) regulation salt and water balance in salmon.
13. Which of the following statements about hormone is incorrect
(A) Most hormones are secreted directly into body fluid such as blood.
(B) Hormones play negative feedback regulation are called antagonistic hormones.
(C) Hormones function like chemical signals to regulate cellular activities within the body.
(D) Hormones may reach all parts of the body, but only certain types of cells have responses.
14. Which hormone exerts antagonistic effect to calcitonin?
(A) calmodulin. (C) epinephrine.
(B) parathyroid hormone. (D) thyroxine.

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15. Which of the following statements about menstrual cycle is incorrect?
(A) It specifically occurs in the endometrium of the uterus.
(B) It is divided into menstrual flow phase, proliferative phase, and secretory phase.
(C) The cycle length is about 28 days, and varies from one woman to another.
(D) It is regulated by FSH and LH, and continues from puberty to death.
16. What cause menopause?
(A) The ova supply is exhausted.
(B) The estrogen production by the ovaries decreases.
(C) High level of progesterone causes negative feedback to inhibit FSH and LH secretion.
(D) Low level of estrogen cause negative feedback to inhibit FSH and LH secretion.
17. Which of the following materials is the major, but not direct energy source of vertebrate muscle cells?
(A) adenosine triphosphate. (C) creatine phosphate.
(B) sodium biphosphate. (D) cyclic adenosine monophosphate.
18. Which of the following statements about human sperm are correct?
(A) The major energy resource is glucose.
(B) Both spermatids and sperms are haploid.
(C) Acrosome contains mitochondria to provide ATP for sperm movement.
(D) When one sperm matures, three smaller cells form polar bodies.
19. Which of the following receptor is incorrectly paired with the type of energy it transduces?
(A) chemoreceptor - gustatory. (C) mechanoreceptor - sound.
(B) nociceptor - olfactory. (D) infrared receptor - heat.
20. Which of following sequence about sound wave transduction from pinna is correct?
(A) tympanic membrane-incus-malleus-stapes-oval window
(B) tympanic membrane-malleus-stapes-incus-oval window
(C) tympanic membrane-malleus-incus-stapes-oval window
(D) tympanic membrane-stapes-incus-malleus-oval window

※ 注意：請於試卷上「非選擇題作答區」依序作答，並應註明作答之題號。

三、簡答題 (20%)

1. DNA methylation:

2. Alternative RNA splicing:

3. Homeobox gene:

4. pattern formation:

試題必須隨卷繳回