

考試科目	生理學 81513	所別	神經科學所 8151	考試時間	2月28日(六)第1節
------	--------------	----	---------------	------	-------------

## 一 選擇題 (每題 2 分，共 20 題)

01. The precision of locating a somatosensory stimulus is greater in areas of the body that
- (A) have large, overlapping receptive fields than in areas with small overlapping fields.
  - (B) have small, overlapping receptive fields than in areas with large overlapping fields.
  - (C) have low density of receptors than in areas with high density of receptors.
  - (D) all of above
02. Which one of the following statement is correct?
- (A) Fat can't enter Glycolysis
  - (B) oxidative phosphorylation can not be involved in carbohydrate metabolism
  - (C) The location of Krebs cycle is in the matrix of mitochondria
  - (D) Under anaerobic condition, the product of glycolysis is pyruvic acid
03. 6. Regarding the structure and synthesis of hormones,
- (A) Steroid hormones are synthesized from cholesterol
  - (B) Thyroid hormones are catecholamines
  - (C) The hormones of the adrenal cortex have the same structure as the neurotransmitters of adrenergic neurons
  - (D) Most peptide hormones require binding proteins for transport in the blood
  - (E) Vasopressin is synthesized in the posterior pituitary
04. What is the osmolarity of 1M  $\text{CaCl}_2$  solution?
- (A) 3 Osm
  - (B) 2 Osm
  - (C) 1 Osm
  - (D) 0.5 Osm
05. Which one of the following statements about rods and cones in the retina is true?
- (A) Cones enable us to see in dim light; rods provide color vision
  - (B) Rods and cones all have the same kind of opsin (pigment protein)
  - (C) Cones are clustered in the fovea; rods are more scattered throughout the retina
  - (D) all of above

考試科目	生理學 8151B	所別	神經科學所 8151	考試時間	2月28日(六)第1節
------	--------------	----	---------------	------	-------------

06. The receptors for hearing are found on the
- (A) Tympanic membrane
  - (B) Oval window
  - (C) Scala vestibule
  - (D) Basilar membrane
07. Which one of the following is not secreted by pancreas?
- (A) HCl
  - (B) enzyme
  - (C) bicarbonate
  - (D) A & C
08. The relative permeability of ion channels during an action potential:
- (A) rising phase: permeability of  $K^+ > Na^+$ , Falling phase: permeability of  $Na^+ > K^+$
  - (B) rising phase: permeability of  $Na^+ > K^+$ , Falling phase: permeability of  $K^+ > Na^+$
  - (C) rising phase: permeability of  $Na^+ = K^+$
  - (D) resting: permeability of  $Na^+ = K^+$
09. If the secretion of "A" can induce "secretion of "B" and the secretion of "B" can induce "C" secretion. Which one of the followings can be considered a negative feedback?
- (A) secretion of "A" promotes the secretion of "C"
  - (B) secretion of "B" inhibits the secretion of "A"
  - (C) secretion of "C" inhibits the secretion of "B"
  - (D) B & C
  - (E) A, B, & C
10. Oxytocin is synthesized in \_\_\_\_\_
- (A) hippocampus
  - (B) medulla
  - (C) anterior pituitary
  - (D) hypothalamus

考試科目	生理學 8151B	所別	神經科學所 8151	考試時間	2月8日(六)第1節
------	--------------	----	---------------	------	------------

11. In the absence of thyroid hormone, epinephrine stimulates release of a small amount of fatty acids from adipose cells. In the presence of thyroid hormone (which has small effect by itself), epinephrine causes a much more substantial release of fatty acids from the cells. The effect of thyroid hormone on epinephrine's actions is called
- (A) Antagonistic
  - (B) Agonistic
  - (C) Permissive
  - (D) Direct
  - (E) Paracrine
12. "Motor unit" refers to
- (A) A single motor neuron plus all the muscle fibers it innervates
  - (B) A single muscle fiber plus all of the motor neurons that innervate it
  - (C) All of the motor neurons supplying a single muscle
  - (D) A pair of antagonistic muscles
  - (E) All of the muscles that affect the movement of any given joint
13. Which one of the following mediates the major body's response to stress?
- (A) Thyroid hormone
  - (B) Growth hormone
  - (C) Cortisol
  - (D) Aldosterone
  - (E) Testosterone
14. Bone growth
- (A) Occurs as a result of osteoblast division
  - (B) Of the long bones requires growth of the epiphyseal cartilage
  - (C) Of the long bones ceases after closure of the epiphyseal growth plate
  - (D) Both B & C

考試科目	生理學 8151B	所別	神經科學所 8151	考試時間	2月28日(六)第1節
------	--------------	----	---------------	------	-------------

15. Which of the following statements is true regarding the emulsification of fats?
- (A) Fat emulsification requires pancreatic lipase
  - (B) Fat emulsification requires secretion of bile salts and phospholipids by the liver
  - (C) Fat emulsification results in the formation of small fat droplets
  - (D) Both fat emulsification requires pancreatic lipase and fat emulsification requires secretion of bile salts and phospholipids by the liver are correct
  - (E) Both B & C
16. Which of the following statements about neural control of digestion is *not* true?
- (A) CNS contributions to neural control of the gastrointestinal system through regulation of the sympathetic, but not the parasympathetic system
  - (B) Sympathetic stimulation is generally inhibitory to digestion
  - (C) Local nerve networks (nerve plexuses) stimulate digestive functions
  - (D) Under normal circumstances, nerve plexuses regulate digestion without input from the autonomic nervous system
17. Which one of the following is not secreted by the anterior pituitary gland?
- (A) Somatotropin
  - (B) Prolactin
  - (C) Corticotropin
  - (D) Erythropoietin
  - (E) TSH
18. The functions of the stomach include
- (A) The complete digestion of protein
  - (B) Dissolving all the food that enters it
  - (C) Killing bacteria
  - (D) Storing partially digested food
  - (E) Both C & D

考試科目	生理學 8151B	所別	神經科學所 8151	考試時間	2月28日(六)第1節
------	--------------	----	---------------	------	-------------

19. Which of the following does *not* correctly describe kidney function? The kidneys
- (A) Contribute significantly to long-term regulation of arterial blood pressure by maintaining the proper plasma volume
  - (B) Produce urine of a fixed composition in order to maintain homeostasis of extracellular fluid
  - (C) Excrete metabolic waste products
  - (D) Secrete hormones

20. Endocrine regulation
- (A) Refers to chemical regulators that are conveyed from one organ to another via the bloodstream
  - (B) Is slower than regulation by neurotransmission
  - (C) Differs from paracrine regulation in that endocrine regulators act on different cell types from those that secreted them, whereas paracrine regulators are secreted by the same cell type on which they act
  - (D) Both A & B are correct
  - (E) All of the choices are correct

二 問答題 (每題 10 分, 共 6 題)

01. 請問如果一隻動物的神經細胞無法有效的進行“exocytosis”，對該動物的生理狀態會產生什麼影響？
02. 在你眼睛閉起來的狀況下，如果有人從背後拍你一下或是拿溫毛巾碰你的手臂，你可以很清楚的知道發生了什麼事，請解釋你的身體是怎麼辦到的。
03. 請分別描述神經細胞內及神經細胞間如何傳遞訊號？
04. 從實驗觀察，你懷疑大腦中海馬迴區域之神經細胞新生可能與某些學習記憶相關，請設計實驗證明此觀點。
05. 就你所學過的生理學(或神經科學)，請描述一你最有心得的主題，並整理寫出你所習得的內容。
06. 品嚐一個你很熟悉的食物，如果你捏著鼻子，閉眼睛，請同學餵你吃(不告知是什麼東西)，你可能吃不出是什麼東西，請就嗅覺及味覺的角度解釋可能的原因。

備

註

- 一、作答於試題上者，不予計分。
- 二、試題請隨卷繳交。