

下列各題的答案請按照次序寫在答案紙上。

In question 1-7, select the single best answer. (7%)

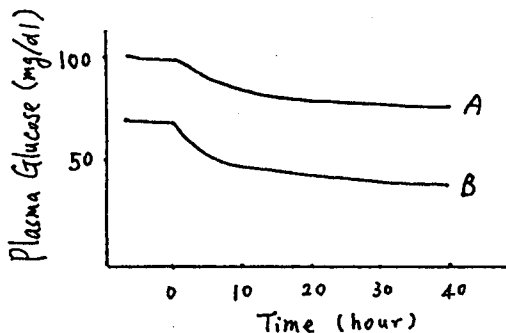
- ( ) 1. ADH secretion will increase following
- (a) severe sweating
  - (b) infusion of 1 L fluid containing 145 mM NaCl
  - (c) ingestion of water
  - (d) all of the above
  - (e) none of the above
- ( ) 2. Thyroid hormone stored in the lumen of follicles is in the form of
- (a) thyroxine
  - (b) triiodotyronine
  - (c) thyroglobulin
  - (d) iodotyrosine
  - (e) all of the above
- ( ) 3. Removal of the pituitary gland would result in
- (a) the development of a goiter
  - (b) decreased synthesis of T<sub>3</sub>
  - (c) hypertrophy of the thyroid
  - (d) increased synthesis of T<sub>4</sub>
  - (e) all of the above
- ( ) 4. Mature spermatozoa are stored in the
- (a) seminal vesicles
  - (b) seminiferous tubules
  - (c) rete testes
  - (d) urethra
  - (e) none of the above
- ( ) 5. Which of the following are incorrectly paired?
- (a) ACTH : increased glucocorticoid secretion
  - (b) Aldosterone : increased the reabsorption of K<sup>+</sup> from the urine
  - (c) Angiotensin II : increased the secretion of aldosterone
  - (d) Atrial natriuretic peptide : inhibited renin secretion
  - (e) Vitamin D : increased the active transport of Ca<sup>2+</sup> and PO<sub>4</sub><sup>3-</sup> from the intestine
- ( ) 6. Parathyroid hormone causes
- (a) increased Ca<sup>2+</sup> release from bone
  - (b) decreased reabsorption of calcium ions by the renal tubules
  - (c) decreased reabsorption of phosphate ions in the plasma
  - (d) all of the above
  - (e) none of the above
- ( ) 7. A woman is given a drug that blocks the ability of estradiol to bind to its receptors. You would expect
- (a) LH and prolactin to increase
  - (b) LH and prolactin to decrease
  - (c) LH to increase and prolactin to decrease
  - (d) LH to decrease and prolactin to increase
  - (e) none of the above

Instructions: Fill in the blanks of the following statements. (4%)

8. In humans, fertilization usually takes place in the \_\_\_\_\_.
9. The analogue of the Granulosa cell in the male is the \_\_\_\_\_ cell.
10. The hypothalamic hormone which inhibits growth hormone secretion is \_\_\_\_\_.
11. The hypothalamic hormone which stimulates LH and FSH release by action on the pituitary gland is \_\_\_\_\_.

Instructions:

Each of the questions below is followed by suggested answers. Select the ONE that is BEST in each case. (4%)



- ( ) 12. Two persons, A and B, were subjected to a total fast (no food) beginning at time "0" in the above figure. The plasma glucose concentration values of A and B during the fast are plotted in the figure. One of the two persons is normal, the other is suffering from adrenal cortical hormone deficiency. The normal person is A or B?
- ( ) 13. Which person will have the greater rate of hepatic gluconeogenesis, A or B?
- ( ) 14. Which person will have the higher concentration of free fatty acids in the plasma during fasting, A or B?
- ( ) 15. Which person will have the higher concentration of glucagon in plasma, A or B?
16. Please describe the steps of respiration (from ambient air to cells, or vice versa) **briefly**. (10%)
17. Please list three factors which can shift the oxygen-hemoglobin dissociation curves. (5%)
18. Please name the factors which determine arteriolar resistance. (10%)
19. Please describe the effects of the sympathetic and parasympathetic nerves on the heart. (10%)
20. 簡述人體之痛覺控制系統。 (5%)
21. 簡述彩色視覺之神經迴路。 (5%)
22. 簡述小腦各區域在控制身體動作方面之功能。 (5%)
23. 解釋名詞, 每小題 1%
  - a. Parkinson's disease
  - b. Receptor potential
  - c. Excitatory postsynaptic potential
  - d. Golgi tendon organs
  - e. Muscle spindles
24. 細胞膜上有許多離子通道, 其主要者有  $\text{Na}^+$ -channels,  $\text{K}^+$ -channels, 及  $\text{Ca}^{2+}$ -channels 等, 請就這三類離子通道各舉一人體生理上的例子, 說明其功能及作用原理。 (9%)
25. 細胞膜上的糖蛋白 (glycoproteins) 在生理上常具有重要功能; 如, 成為某些訊息的受體。請描述這些糖蛋白的合成經過及輸送到細胞膜上的途徑。 (6%)
26. 您所飼養的動物生病了, 您懷疑它的腎功能出了問題, 假設您是在一個醫學實驗室工作, 藥品及設備皆齊全, 請問您應該做什麼樣的試驗, 並解釋這些試驗的生理意義。 (10%)
27. 試繪一腎細胞圖形以說明在正常人尿中測不到葡萄糖的理由。 (5%)