

國立體育學院九十一學年度研究所碩士班入學考試試題
人體生理學 (本試題共 四 頁)

※ 注意:答案一律寫在答案卷上, 否則不予計分

甲、選擇題 (各 2 分)

1. 生物迴饋系統 (biological feedback system) 的基本功能
A. protect from injury
B. control body temperature
C. muscle contraction
D. produce sweat
E. cotransport molecules
F. maintain body homeostasis
G. all of the above
H. none of the above
2. 細胞膜 (cell membrane)
A. consists mostly of lipid bilayers
B. contains some cholesterol
C. has protein molecules interspersed in it
D. is flexible
E. has channels for certain molecules to pass through
F. all of the above
G. none of the above
3. Na-K pump
A. Na^+ and K^+ are pumped out of the cell
B. do not need energy
C. Na^+ is pumped out, while K^+ is pumped into the cell
D. Na^+ and K^+ are pumped "downhill"
E. is not limited by available protein transporters
F. all of the above
G. none of the above
4. 葡萄糖 (glucose) 由小腸運輸入血液的途徑
A. countertransport
B. pinocytosis
C. primary active transport
D. facilitated diffusion
E. cotransport
F. simple diffusion
G. all of the above
H. none of the above
5. 細胞膜電位 (membrane potential) 由靜止的 -90 mV 改變為 -100 mV 稱作
A. repolarization
B. hyperpolarization
C. depolarization
D. action potential
E. cross-bridge coupling
F. negative potential
G. all of the above
H. none of the above
6. 動作電位 (action potential) 發生後, 恢復靜止膜電位 (resting membrane potential) 的機轉是
A. an increase of permeability to K^+ ions
B. $\text{Na}, \text{K}-\text{ATPase}$
C. the diffusion of Na^+ ions out of the cell
D. $\text{Ca}-\text{ATPase}$
E. an increase of permeability to Cl^- ions
F. afterpotential
G. all of the above
H. none of the above
7. 細胞膜的氧氣運輸方式
A. filtration
B. pinocytosis
C. active transport
D. facilitated diffusion
E. mediated transport
F. simple diffusion
G. all of the above
H. none of the above
8. Antidiuretic hormone
A. increase growth in tissue
B. oppose the action of aldosterone
C. increase glucose uptake in skeletal muscle
D. decrease blood pressure
E. increase kidney water reabsorption by increasing Na-K pumps
F. decrease kidney excretion of water
G. all of the above
H. none of the above

9. 可調節血液酸度的內分泌是
- A. insulin
 - C. thymosin
 - E. betaendorphins
 - G. all of the above
 - B. aldosterone
 - D. prolactin
 - F. luteinizing hormone
 - H. none of the above
10. 橫橋 (cross-bridges) 不出現於
- A. thick myofilament
 - C. myosin
 - E. a sarcomere
 - G. none of the above
 - B. H zone
 - D. A band
 - F. all of the above
11. 心房再極化 (atrial repolarization) 出現的時刻
- A. P wave
 - C. T wave
 - E. R wave
 - G. all of the above
 - B. QRS-complex
 - D. Q wave
 - F. S waves
 - H. none of the above
12. 副交感神經 (parasympathetic nerve) 支配
- A. purkinje fibers
 - C. atrioventricular bundle
 - E. SA node only
 - G. all of the above
 - B. both AV node and SA node
 - D. both atrial and ventricular myocardium
 - F. AV node only
 - H. none of the above
13. 正常吸氣時，肺內壓 (intrapulmonary pressure) 是
- A. higher than atmospheric pressure
 - C. equal to atmospheric pressure
 - E. lower than the atmospheric pressure
 - G. all of the above
 - B. about 762 mm Hg
 - D. about 700 mm Hg
 - F. 760 mm Hg
 - H. none of the above
14. Amylase 轉變 _____ 為 _____
- A. polysaccharides, maltose and isomaltose
 - C. polypeptides, dipeptides
 - E. triglycerides, 2 fatty acids and monoglycerol
 - G. all of the above
 - B. polysaccharides, glucose and galactose
 - D. dipeptides, amino acids
 - F. lactose, fructose and fructose
 - H. none of the above
15. 保護腸胃道被消化的物質是
- A. intestinal bacteria
 - C. salivary lysosomes
 - E. gastric hydrochloric acid
 - G. all of the above
 - B. mucin
 - D. bicarbonate ions
 - F. salivary serous secretion
 - H. none of the above
16. Glomerular filtration 過程中
- A. allows water, Na⁺ ions, and glucose to pass through
 - B. the rate is controlled by diffusion gradient
 - C. occurs in the liver to filter toxic substances
 - D. allows most plasma proteins to pass through
 - E. regulate body fluid volume
 - F. all of the above
 - G. none of the above

17. 影響 oxyhemoglobins 的氧飽和度有
- A. alveolar PO_2
 - B. tissue PO_2
 - C. 2,3-DPG
 - D. iron in the heme
 - E. blood pH
 - F. blood temperature
 - G. all of the above
 - H. none of the above
18. 血液 pH 變化的感應器是
- A. aorta and carotid baroreceptors
 - B. aorta and carotid chemoreceptors
 - C. golgi apparatus
 - D. muscle spindles
 - E. proprioceptors
 - F. SA node
 - G. all of the above
 - H. none of the above
19. 心輸出量 (cardiac output) 相等於
- A. stroke volume
 - B. heart rate
 - C. blood pressure
 - D. capillary blood flow
 - E. coronary blood flow
 - F. pulmonary blood flow
 - G. all of the above
 - H. none of the above
20. 由小至大順序
- A. myosin, actin, myofibril, muscle, fasciculus, muscle fiber
 - B. actin, myosin, myofibril, muscle fiber, fasciculus, muscle
 - C. actin, myosin, muscle fiber, fasciculus, myofibril, muscle
 - E. muscle, fasciculus, muscle fiber, myofibril, myosin, actin
 - F. muscle fiber, actin, myosin, fasciculus, myofibril, muscle
 - G. all of the above
 - H. none of the above

乙、依據圖 3.3 及 3.8 撰寫一篇具有生理機轉的學術論述性文章。(60 分)

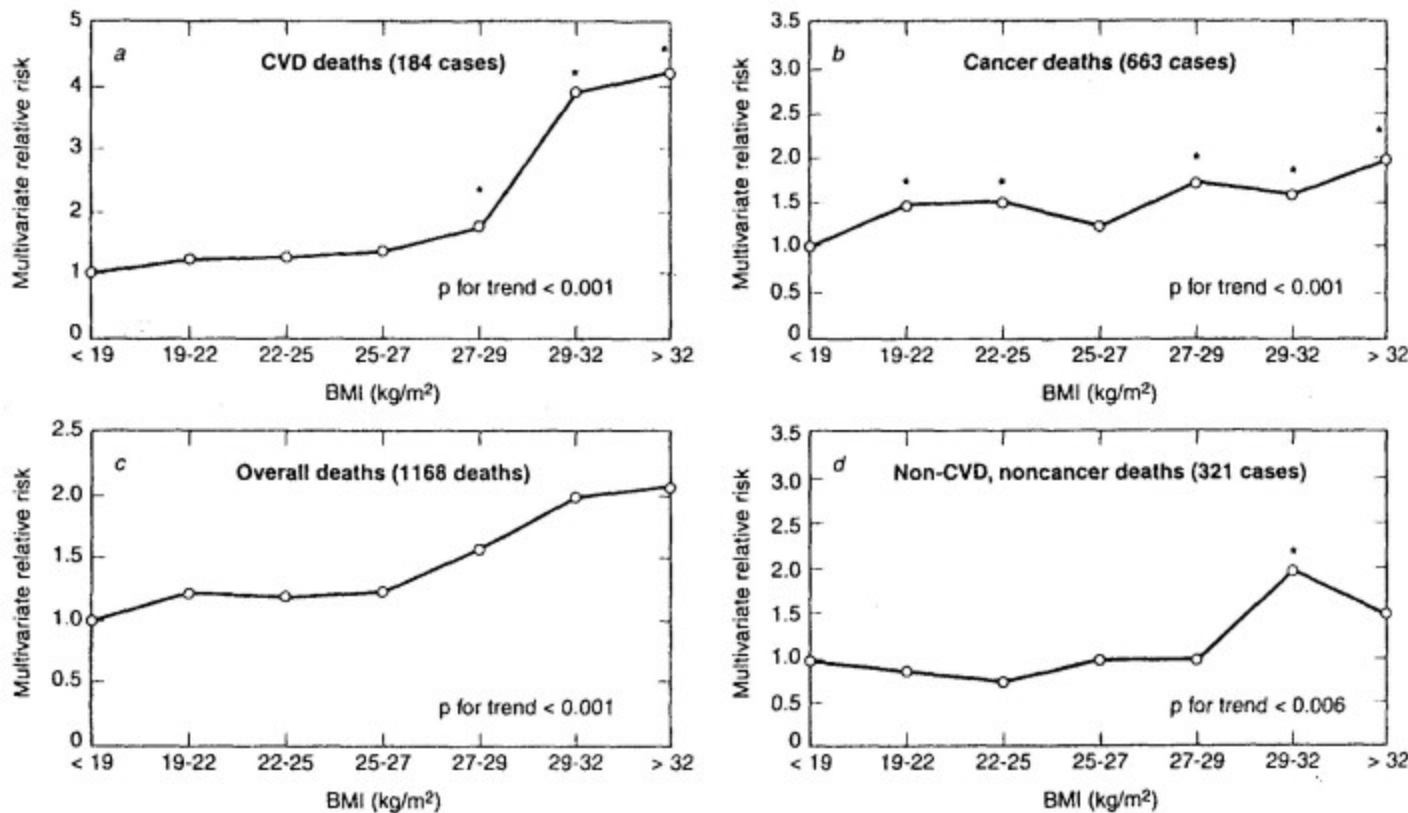


Figure 3.3 Relation of body mass index (BMI) to risk of death in the Nurses Health Study (16). Plots are for (a) deaths caused by cardiovascular disease (CVD), (b) deaths caused by cancer, (c) total deaths, and (d) noncancer and non-CVD deaths. The multivariate relative risk refers to the relative risk of death compared to the lowest BMI determined from multivariate statistical analysis. Asterisks indicate data for which $p < 0.05$.

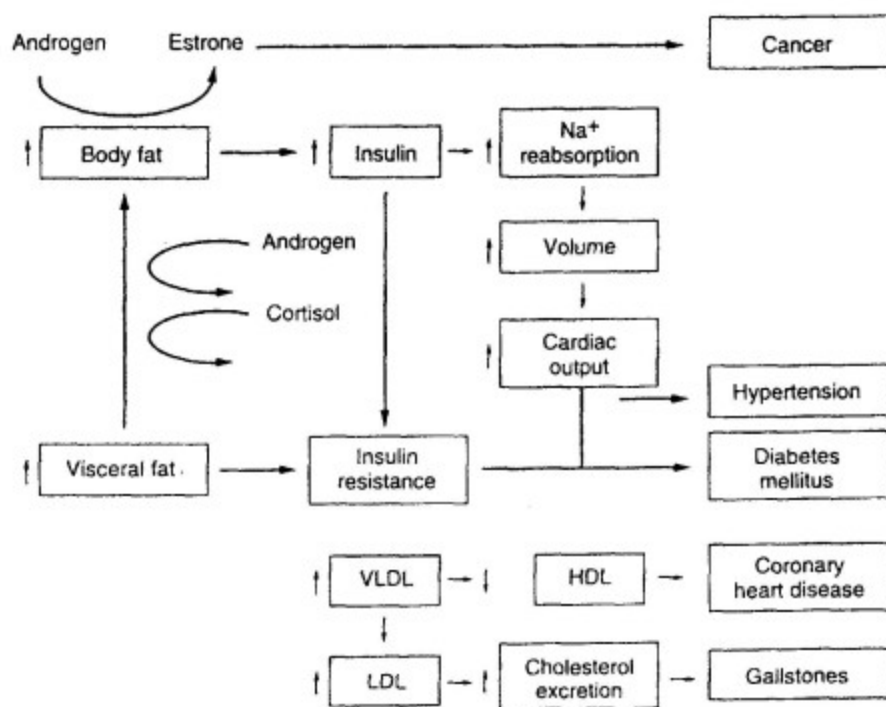


Figure 3.8 Factors influencing accumulation of visceral fat and its effect on mortality. Increasing body-fat stores increase the production of estrone from androgen and provide one cause for the increased risk of breast and uterine cancer in overweight women. The increased production of cortisol in the visceral fat, along with insulin resistance, can be helpful in explaining the genesis of hypertension, diabetes mellitus, coronary heart disease, and gallstones.