

**Part I : 50%**

**A. Each question below contains five suggested answers. Choose the one best response to each question. (30%)**

1. The effect of insulin on glucose transport is to
  - (A) Permit transport against a concentration gradient
  - (B) Enhance transport across the cell membrane
  - (C) Enhance transport across the tubular epithelium of the kidney
  - (D) Enhance transport into the brain
  - (E) Enhance transport through the intestinal mucosa
  
2. Which of the following statements regarding capacitation of spermatozoa is **TRUE** ?
  - (A) It occurs in the epididymis
  - (B) It involves synthesis of androgen binding protein
  - (C) It is stimulated by testosterone
  - (D) It is accompanied by release of acrosomal enzymes
  - (E) None of the above
  
3. Hyperglycemia is induced by all the following hormones **EXCEPT**
  - (A) Epinephrine
  - (B) Thyroxine
  - (C) ACTH
  - (D) Glucagon
  - (E) Aldosterone
  
4. Immediate compensatory reactions to hemorrhagic shock include
  - (A) Decreased peripheral resistance
  - (B) Constriction of the vessels of the brain and heart
  - (C) Reduced levels of circulating catecholamines
  - (D) Excessive loss of  $\text{Na}^+$  in the urine
  - (E) None of the above

(背面仍有題目,請繼續作答)

5. The largest portion of the arterial pressure generated during systole is dissipated at which of the following locations in the vascular tree ?
- (A) Aortic arch
  - (B) Aorta-arterial juncture
  - (C) Arterial-arteriolar juncture
  - (D) Arteriolar-capillary juncture
  - (E) Capillary-venular juncture
6. Hypertension is a common complication of all the following conditions **EXCEPT**
- (A) Anaphylaxis
  - (B) Pregnancy
  - (C) Cushing's syndrome
  - (D) Posterior fossa tumor
  - (E) Pyelonephritis
7. Which of the following statements regarding production of platelets in the bone marrow (thrombopoiesis) is **TRUE** ?
- (A) It proceeds through a series of cell divisions from immature diploid precursors
  - (B) It involves fragmentation of the cytoplasm of megakaryocytes
  - (C) It requires synthesis of von Willebrand factor
  - (D) It is reduced in hypersplenic states
  - (E) None of the above
8. Alveolar type I epithelial cells are described by which of the following statements ?
- (A) They occupy 10 percent of the alveolar surface
  - (B) They are rich in cytoplasmic organelles
  - (C) They undergo mitotic division in response to noxious stimuli
  - (D) They form tight intercellular junctions
  - (E) None of the above
9. Electric stimulation of the respiratory center of the midbrain, resulting in hyperventilation, will produce all the following effects **EXCEPT**
- (A) Increased oxygen tension

- (B) Decreased carbon dioxide tension
- (C) Decreased carbonic acid content of body fluids
- (D) Decreased excretion of bicarbonate in the urine
- (E) Renal resorption of ammonium ions and titratable acids

10. Glomerular filtration rate would be decreased by all the following EXCEPT

- (A) Constriction of the afferent arterioles
- (B) Hypoalbuminemia
- (C) Glomerulosclerosis
- (D) Ureteral obstruction
- (E) Compression of the renal capsule

11. Major determinants of plasma osmolarity include all the following EXCEPT

- (A) Sodium
- (B) Hemoglobin
- (C) Chloride
- (D) Albumin
- (E) Glucose

12. Amino acids are almost completely resorbed from the glomerular filtrate via active transport in the

- (A) Proximal tubule
- (B) Loop of henle
- (C) Distal tubule
- (D) Collecting duct
- (E) Renal pelvis

13. Saliva has all the following constituents EXCEPT

- (A) Bicarbonate
- (B) Phosphate
- (C) Chloride
- (D) Glucose
- (E) Lysozyme

(背面仍有題目,請繼續作答)

14. The action potential of muscle is initiated by which of the following membrane changes ?

- (A) A decrease in membrane permeability to calcium ions
- (B) A decrease in membrane permeability to sodium ions
- (C) A decrease in membrane permeability to potassium ions
- (D) An increase in membrane permeability to sodium ions
- (E) An increase in membrane permeability to potassium ions

15. All the following compounds have been shown to be neurotransmitters EXCEPT

- (A) Serotonin
- (B) Glycine
- (C)  $\beta$ -endorphin
- (D) Somatomedin
- (E) Thyrotropin-releasing hormone

**B. Name the three chemical buffer systems of the body and describe how they operate to resist pH changes. (5%)**

**C. Describe the regulation of the ovarian and menstrual cycles. (10%)**

**D. Name and explain briefly the various factors involved in the regulation of heart rate. (5%)**

**Part II : 50%**

一、試討論不同心臟組織之動電位之異同。(20%)

二、消化液分泌是怎樣調控？(10%)

三、試比較心臟肌肉骨骼肌及平滑肌於生理上的異同。(10%)

四、請討論過去十年內，任何一項生理學上的重要發現。(10%)