

## UNIVERSITI SAINS MALAYSIA

First Semester Examination  
2003/2004 Academic Session

September - October 2003

**ZCT 531/4 - Human Anatomy and Physiology**

Time : 3 hours

Please check that the examination paper consists of **FOURTEEN** printed pages before you commence this examination.

Answer any FIVE questions. Students are allowed to answer all questions in English OR Bahasa Malaysia OR combinations of both.

1. (a) Briefly explain why is it that we can liken body cells to individuals in a society. (15/100)
- (b) Briefly discuss the concept of homeostatis. (20/100)
- (c) In anatomy, the following terms are encountered. Explain their meaning. (20/100)
  - sagittal plane
  - parasagittal plane
  - frontal plane
  - medial
  - lateral
  - proximal
  - distal
  - superficial
  - anterior
  - posterior
- (d) Explain the difference between generator potentials and action potentials, providing some details of the events taking place. (45/100)

2. (a) Briefly explain the functions of the circulatory system and the factors that control cardiac output. (50/100)
- (b) Outline the functions of the air passageways of the respiratory system. (25/100)
- (c) With the help of examples, explain why it is better to breathe in deeply but at a slower rate than shallowly at a higher rate. (25/100)
3. (a) Briefly explain the role of the troponin - tropomyosin complex in skeletal muscle contraction. (25/100)
- (b) Explain the differences between isotonic and isometric contraction as well as the term fused tetanus in isometric contraction. (20/100)
- (c) Identify the parts of the humerus bone shown as A to E in Figure 1. (5/100)
- (d) List the various components that form the integumentary system and briefly explain their functions. (50/100)

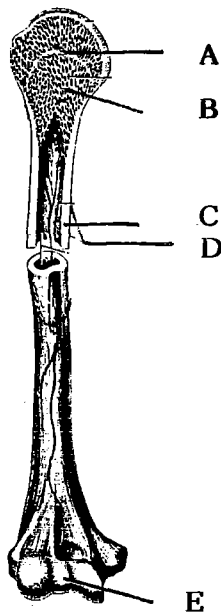
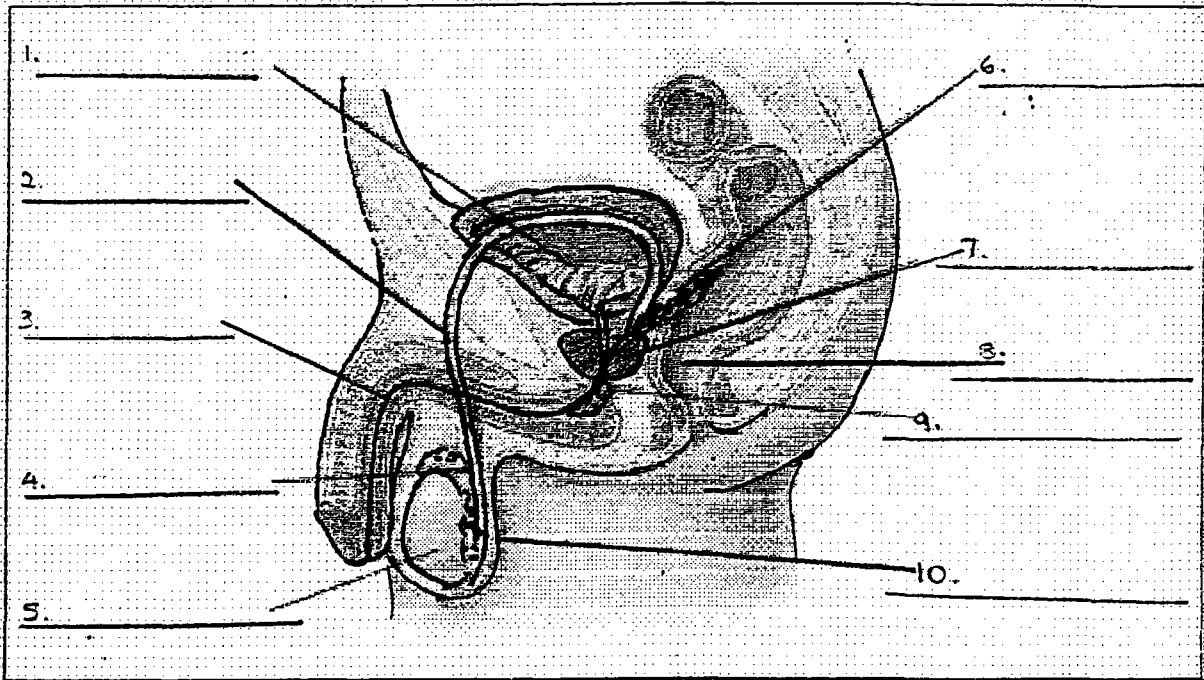


Fig. 1

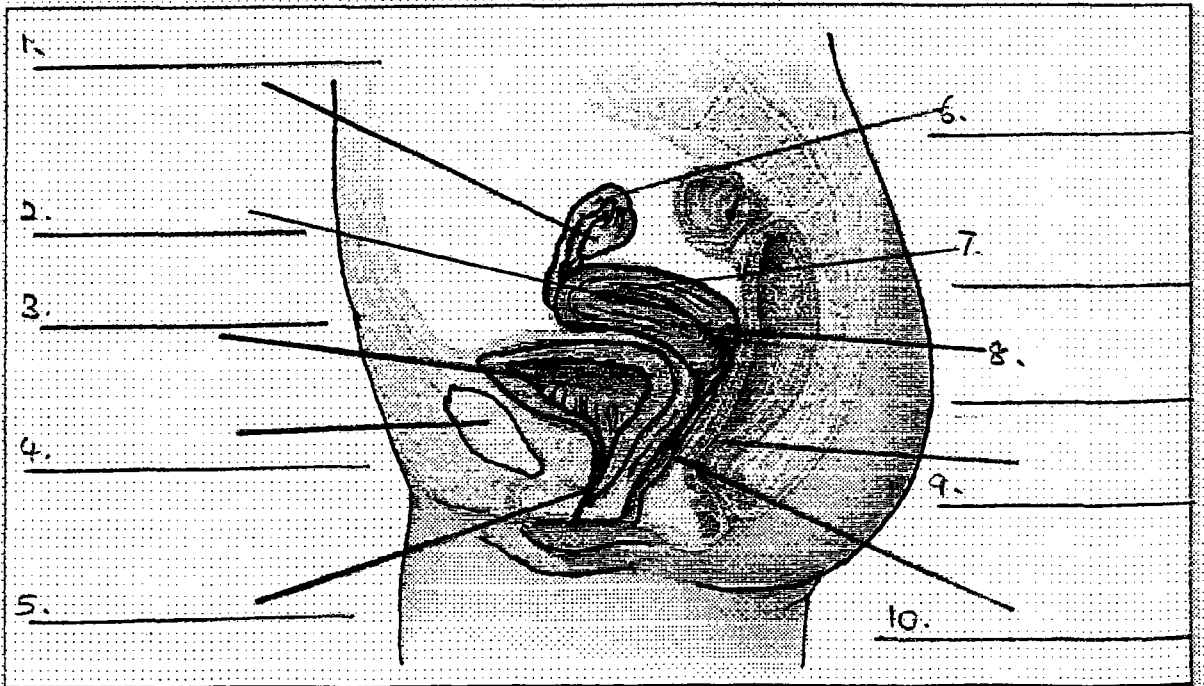
4. (a) Write short notes on the following
- |       |                       |          |
|-------|-----------------------|----------|
| (i)   | Peristalsis           | (10/100) |
| (ii)  | Digestive enzymes     | (20/100) |
| (iii) | Pancreas              | (20/100) |
| (iv)  | Hormones in pregnancy | (20/100) |

- (b) Label the diagrams.  
 (the items listed below may be used more than once or not at all)

### Male Anatomy



### Female Anatomy



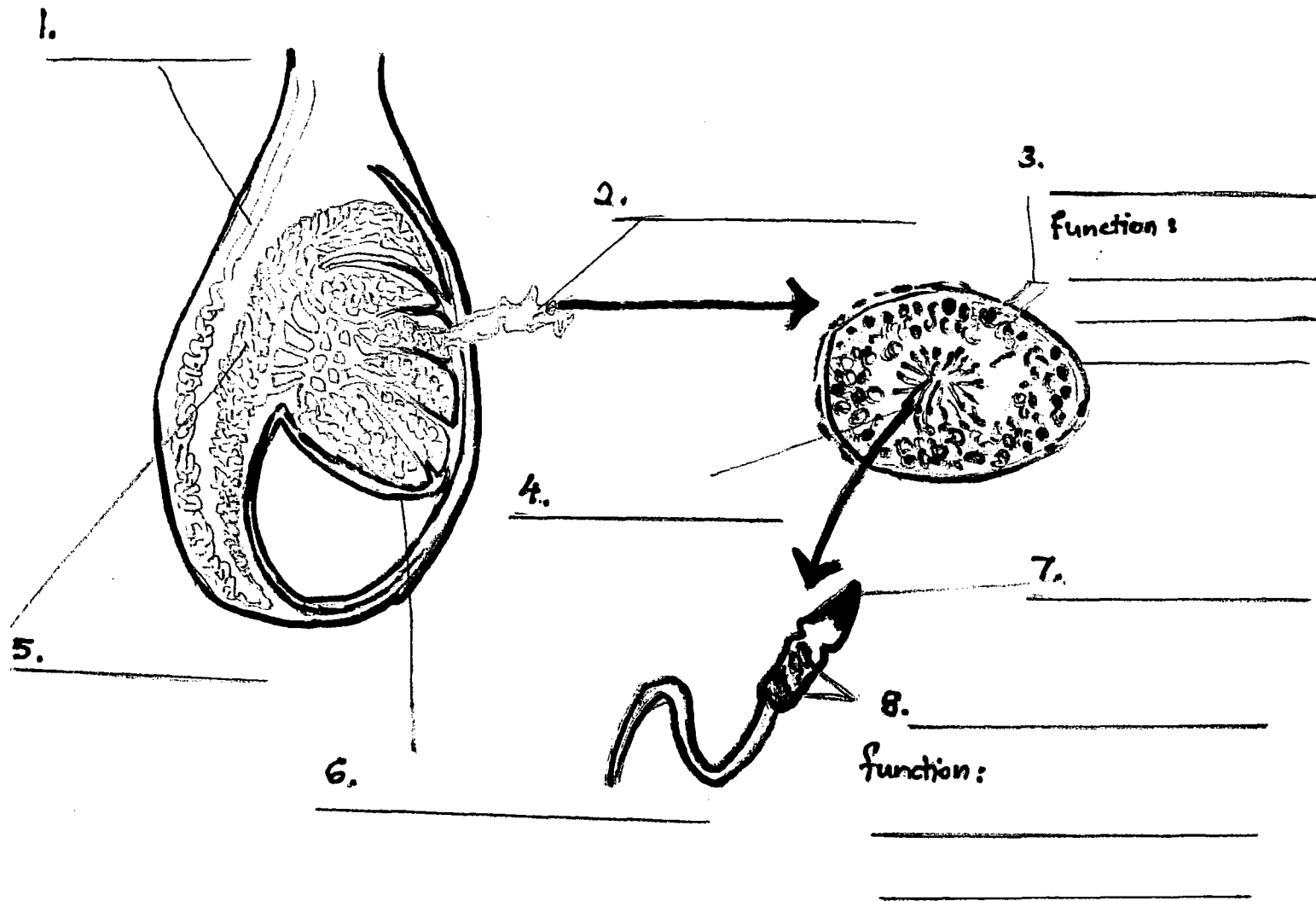
Scrotum    Oviduct    Testis    Ovary    Uterus    Ureter    Urethra    Rectum  
 Vagina    Cervix    Epididymis    Bulbourethral gland    Endometrium    Seminal  
 vesicle    Urinary bladder    Pubic symphysis    Vas deferens    Prostate gland.

(20/100)

...11/-

(c) Anatomy of the Testis  
Fill in the blanks

125



(10/100)

...12/-

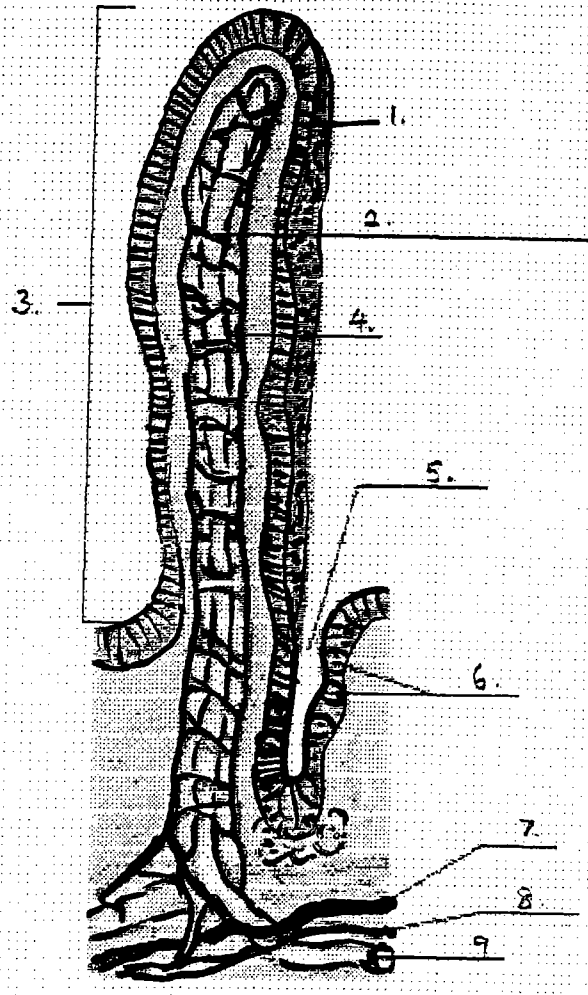
5. (a) With the help of examples, describe the control of hormone secretion. (20/100)
- (b) Explain the stress response or general adaptive syndrom (GAS). (20/100)
- (c) Write short notes on the following:
- (i) Parathyroid gland
  - (ii) Thyroid gland
  - (iii) Adrenal gland
  - (iv) Anterior pituitary gland
- (40/100)
- (d) Mr. M has been suffering from extreme thirst. He drinks many glasses of water every day and produces a lot of urine.
- Name 2 disorders that could produce this condition.
- What tests could a doctor do to differentiate which disorder is present?
- (10/100)
- (e) Fill in the effect and site of production of the following hormones:

Hormone	Effect	Site of production
FSH in males		
Testosterone		
Oestrogen		
HCG		
Progesterone		

(10/100)

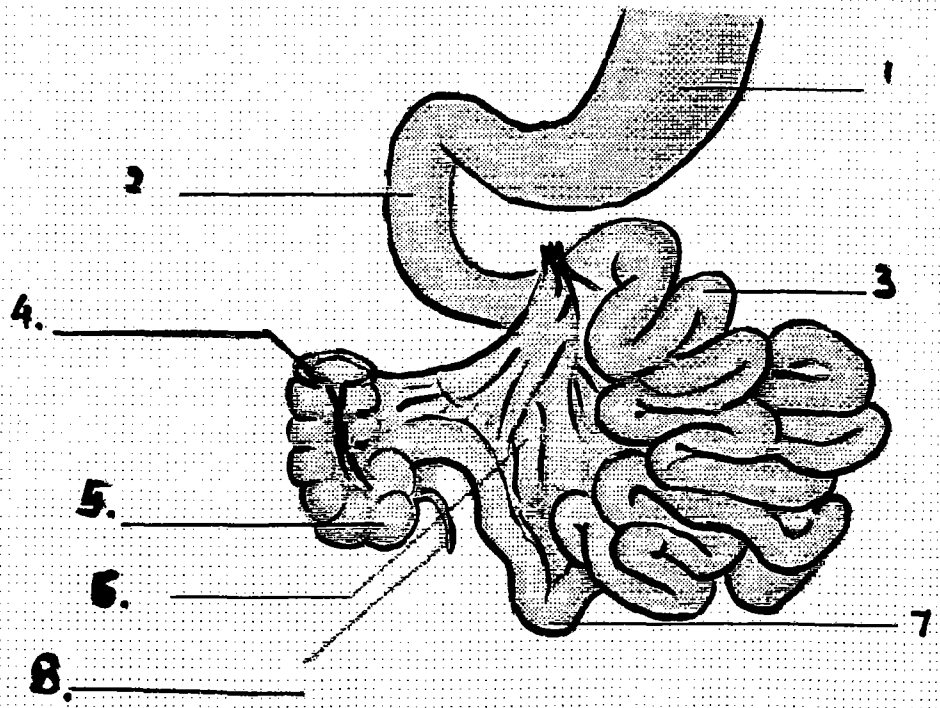
6. (a) With the help of a diagram, describe the functional unit of the kidney. (15/100)
- (b) Describe the steps in urine formation i.e. filtration, secretion, absorption, counter-current mechanism. (20/100)
- (c) Write short notes on the following:
- (i) Anti-diuretic Hormone
  - (ii) Aldosterone
- (20/100)
- (d) Answer the following by giving a word, relevant phrase/phrases:
- (i) The most abundant cation in intracellular fluid which plays a key role in establishing the resting potential.  
Answer: \_\_\_\_\_
  - (ii) The most abundant mineral in the body which plays important roles in blood clotting, neurotransmitter release, maintenance of muscle tone, and excitability of nervous and muscle tissue.  
Answer: \_\_\_\_\_
  - (iii) The most abundant extracellular cation which is essential in fluid and electrolyte balance.  
Answer: \_\_\_\_\_
  - (iv) Can be caused by excessive vomiting of gastric contents, gastric suctioning, or excessive intake of alkaline substances.  
Answer: \_\_\_\_\_
- (4/100)
- (e) Describe the different stages of labour and identify the hormones that are important in late pregnancy, labour and the post-natal period. (24/100)

(f) Fill in the blanks.



Structure of a single intestinal villus.

### Small Intestine



(17/100)

- Ileum Ascending colon Stomach Duodenum Jejunum Appendix Mesentery Caecum
- Arteriole Blood capillary network Goblet cells Intestinal gland Lacteal Lymph vessel
- Simple columnar epithelium Venule Villus