

- 1.2 Which one of the following substances is produced in the melanocytes of the skin?
- A. Melanin
 - B. Vitamin A
 - C. Vitamin D
 - D. Sweat
- 1.3 Which one of the following is NOT part of urine?
- A. Urea
 - B. Salts
 - C. Water
 - D. Plasma proteins
- 1.4 The blood vessel(s) located between the afferent and efferent arterioles of the kidney:
- A. Interlobar veins
 - B. Arcuate arteries
 - C. Glomerulus
 - D. Renal artery
- 1.5 Which one of the following hormones will be secreted to produce less urine when a person is dehydrated?
- A. Antidiuretic hormone (ADH)
 - B. Cortisone
 - C. Renin
 - D. Thyroxin stimulating hormone (TSH)
- 1.6 The hormone secreted by the adrenal gland and associated with sodium reabsorption is _____.
- A. renin
 - B. erithropoietin
 - C. Antidiuretic hormone (ADH)
 - D. aldosterone
- 1.7 A neurotransmitter substance secreted by the synapse is _____.
- A. acetylcholine
 - B. sodium
 - C. aldosterone
 - D. Antidiuretic hormone (ADH)
- 1.8 The cerebral hemispheres are connected by the _____.
- A. corpus callosum
 - B. arbor vitae
 - C. midbrain
 - D. duramater

1.9 The arbor vitae is situated in the _____.

- A. cerebellum
- B. cerebrum
- C. spinal cord
- D. ventricles

1.10 Which part of the central nervous system has its white matter on the outside?

- A. Cerebrum
- B. Cerebellum
- C. Spinal cord
- D. Midbrain

Questions 1.11 to 1.13 refer to the diagram below.

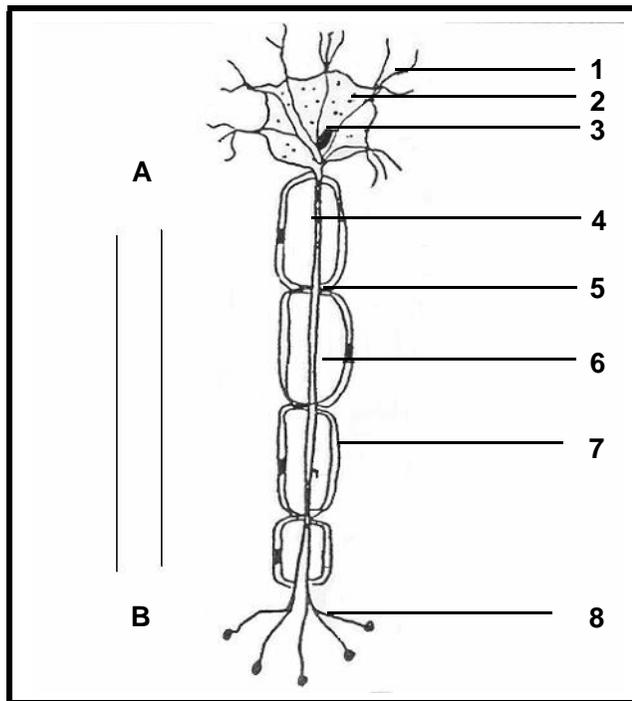


Figure 1.11
The structural unit of the nervous system

1.11 The impulse is conducted _____.

- A. from A to B
- B. from B to A
- C. in both directions
- D. None of the above.

- 1.12 The diagram represents a/an _____.
- A. monopolar neuron
 - B. sensory neuron
 - C. multipolar neuron
 - D. interneuron
- 1.13 Number 5 represents the _____.
- A. node of Ranvier
 - B. axon
 - C. Schwann cell
 - D. neurilemma
- 1.14 If the balance of a person is disturbed the following structure(s) is/are affected:
- A. Cerebrum
 - B. Cerebellum
 - C. Semicircular canals
 - D. Both B and C
- 1.15 The _____ glands in the eyes secrete oil that mixes with the tears (lacrimal fluid).
- A. lacrimal
 - B. Meibomian
 - C. cerumen
 - D. cebum
- 1.16 Which one is NOT a primary taste sensation?
- A. Sweet
 - B. Bitter
 - C. Salt
 - D. Spicy
- 1.17 If a person is nearsighted the _____.
- A. lens is too flat
 - B. lens is too convex
 - C. eye balls are too elongated
 - D. Both B and C are correct.
- 1.18 The _____ is/are stimulated by chemical substances found in food.
- A. sensory hair cells in the olfactory region
 - B. proprioceptors
 - C. organ of Corti
 - D. Ruffin corpuscles

- 1.19 Which one of the following is NOT an endocrine gland?
- A. Thyroid gland
 - B. Lacrimal glands
 - C. Parathyroid glands
 - D. Pancreas
- 1.20 The meiotic cell-division process that produces the ovum is _____.
- A. spermatogenesis
 - B. mitosis
 - C. oogenesis
 - D. fertilization
- 1.21 The gland that secretes fructose as part of semen:
- A. Cowper's gland
 - B. Prostate gland
 - C. Seminal vesicles
 - D. Sertoli cells
- 1.22 The structure where sperms are stored until they reach maturity:
- A. Seminal vesicles
 - B. Prostate gland
 - C. Cowper's gland
 - D. Epididymus
- 1.23 The place where fertilization occurs:
- A. Vagina
 - B. Fallopian tubes
 - C. Ejaculation tube
 - D. Uterus
- 1.24 The _____ is/are responsible for pH balance, excretion of nitrogenous waste products and salt and water regulation in the body.
- A. skin
 - B. kidneys
 - C. lungs
 - D. liver

- 1.25 Which one of the following substances is excreted by the lungs?
- A. Salts
 - B. Urea
 - C. Carbon dioxide
 - D. Oxygen
- 1.26 An increase in one of the following factors will cause proteins and enzymes to denature.
- A. Glucose
 - B. Temperature
 - C. Salts
 - D. Water
- 1.27 Gastrin stimulates the following organ:
- A. Gall bladder
 - B. Pancreas
 - C. Small intestines
 - D. Stomach
- 1.28 A person with a high metabolic rate has an oversecretion of _____.
- A. parathormone
 - B. thyroxin
 - C. growth hormone
 - D. oestrogen
- 1.29 Which part may be damaged should proteins and blood cells be present in urine?
- A. Glomerulus
 - B. Loop of Henlé
 - C. Collecting duct
 - D. Bladder
- 1.30 The part of the cerebrum responsible for smell, taste and hearing:
- A. Temporal lobe
 - B. Parietal lobe
 - C. Frontal lobe
 - D. Occipital lobe

30x2=[60]

QUESTION 2

Choose the **term** in **COLUMN B** that best fits the **description** in **COLUMN A**. Write only the appropriate letter next to the question number in your answer book.

| COLUMN A DESCRIPTION | | COLUMN B TERM | |
|-------------------------|--|------------------|--------------------------------|
| 2.1 | Acts as a buffer when the pH in the kidneys drops | A. | Bipolar neurons |
| 2.2 | Example of a conditioned reflex | B. | Insulin |
| 2.3 | Urea is produced in this organ | C. | Parasympathetic nervous system |
| 2.4 | Active absorption needs it | D. | Pancreas |
| 2.5 | It is a sensory neuron | E. | Sharp light |
| 2.6 | Pupil constricts | F. | Energy |
| 2.7 | This part is filled with perilymph | G. | Tympanic canal/ Scala tympani |
| 2.8 | This system has the same influence as adrenalin | H. | Tissue fluid |
| 2.9 | This hormone stimulates the liver to convert glycogen to glucose | I. | Liver |
| 2.10 | Oversecretion of this hormone causes oedema | J. | Playing piano |
| | | K. | Bicarbonate ions |
| | | L. | Cortisone |
| | | M. | Middle ear |
| | | N. | Glucagon |
| | | O. | Astigmatism |

(10)

QUESTION 3

Give the correct **physiological term** for each of the following descriptions.

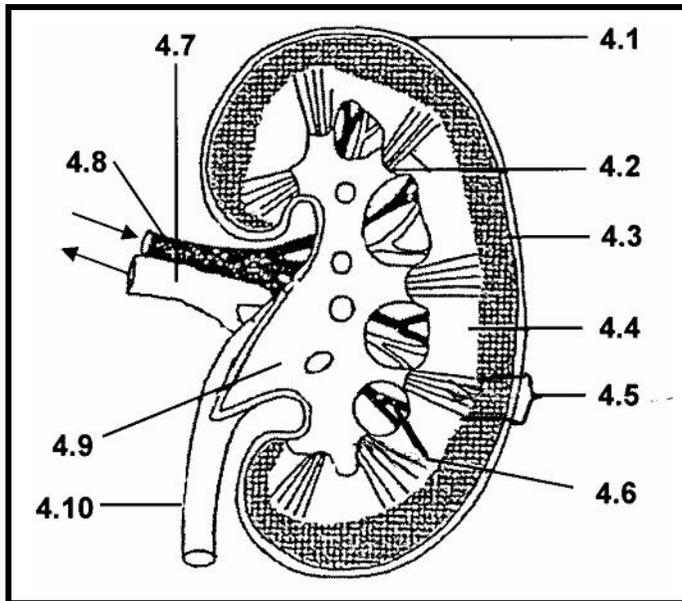
- 3.1 The substance produced through the deamination of amino acids in the liver
- 3.2 The fibrous connective layer that protects the kidney
- 3.3 The part of the kidney that is influenced by antidiuretic hormone (ADH)
- 3.4 The blood vessel that transports pure, deoxygenated blood out of the kidney
- 3.5 The pigment that is produced by the skin to protect the body against UV rays from the sun
- 3.6 The layer of the skin that produces new cells through mitosis
- 3.7 The maintenance of a constant internal environment in the body
- 3.8 The structures that are stimulated by a change in the environment

- 3.9 The fluid that is formed from the excess tissue fluid
- 3.10 The outer wall of the uterus
- 3.11 This gland is also known as the **old mans** gland
- 3.12 This structure connects the foetus and the mother to each other
- 3.13 The cells in the testis that secrete nutrients for the developing sperms
- 3.14 The part of the pancreas in which alpha and beta cells are found
- 3.15 The shedding of the endometrium if fertilization does not take place

[15]

QUESTION 4

4.1 Study the diagram of the kidney below and label structures 4.1 to 4.10.



The internal structure of the kidney

(10)

4.2 Draw a labelled diagram of a taste bud.

(5)
[15]

TOTAL FOR SECTION A: [100]

SECTION B

QUESTION 5

- 5.1 5.1.1 Which hormone is secreted by the hypophysis that stimulates the thyroid gland to secrete thyroxin? (2)
- 5.1.2 Name a second hormone also secreted by the thyroid gland. (2)
- 5.1.3 Name THREE functions of the hormone thyroxin. (3)
- 5.1.4 Which element must form part of your daily diet for thyroxin to be produced? (1)
- 5.1.5 Name the deficiency disease caused by an undersecretion of thyroxin in:
- (a) a child.
- (b) an adult. (2)
- 5.1.6 The growth hormone is also secreted by the hypophysis.
- (a) Give the other name for the growth hormone. (1)
- (b) Name TWO target organs of the growth hormone. (2)
- (c) Name the disease in adults if there is an oversecretion of growth hormone. (2)
- (d) Describe the symptoms of the disease mentioned in Question 5.1.6 (c). (3)
- 5.2 The hypophysis also secretes various hormones that influence the reproductive organs (breasts and ovaries) of the female system.
- 5.2.1 Complete the following table by filling in the missing details on the two hormones that influence the breasts. Write only the letters a to f and the correct answers in your answer book. (6)

| LOBE OF HYPOPHYSIS THAT SECRETES THE HORMONE | HORMONE | FUNCTION OF THE HORMONE |
|--|---------|-------------------------|
| a | b | c |
| d | e | f |

- 5.2.2 Name the TWO hormones that regulate the activity of the ovaries as well as the functions of each hormone. (5)

5.3 During puberty of a boy the cells of Leydig situated in the testis start to secrete a hormone.

5.3.1 What is the other name for the cells of Leydig? (1)

5.3.2 Name the hormone secreted by the cells of Leydig. (2)

5.3.3 Name FIVE secondary sex characteristics of boys. (5)

5.4 5.4.1 Complete the following table by filling in the missing details on the glands found in the skin. Write only the letters with the correct answers in your answer book.

| Where is the gland situated? | Gland | Secretion | Function of secretion |
|--------------------------------|-------|-----------|-----------------------|
| In the follicle of the hair | a | b | c |
| In the external auditory canal | d | e | f |
| In the dermis | g | h | i |

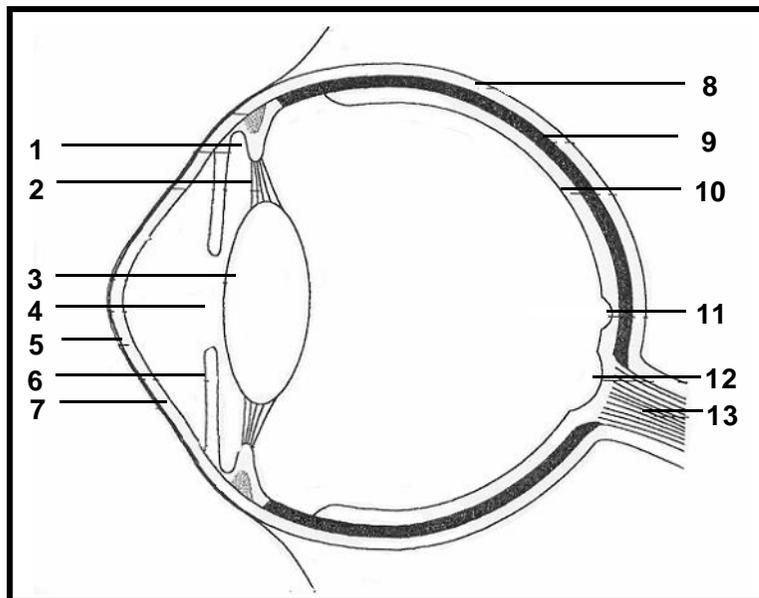
(9)

5.4.2 Name FOUR other functions of the skin, except for those mentioned in Question 5.4.1.

(4)
[50]

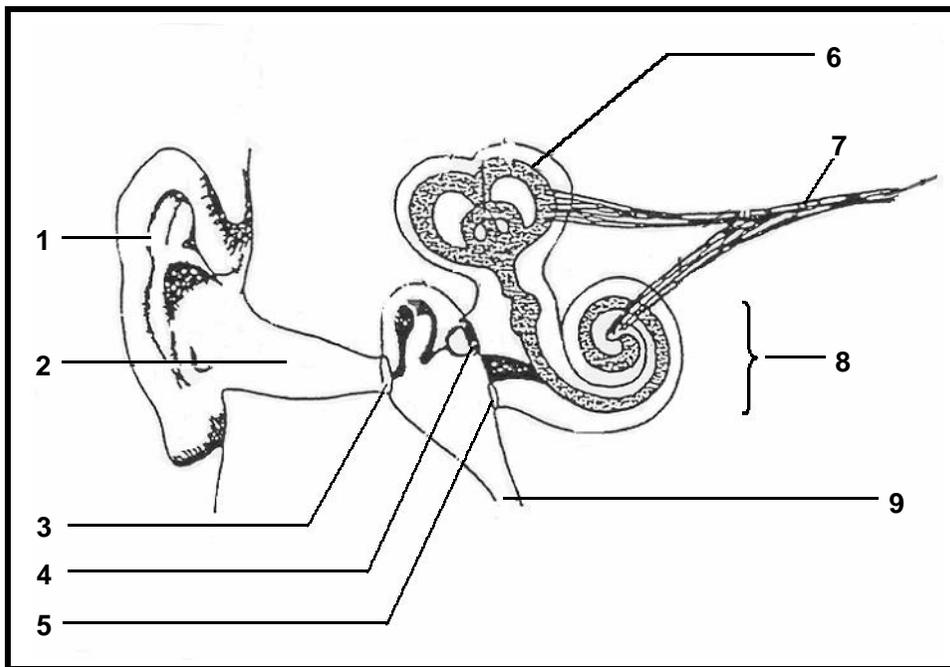
QUESTION 6

6.1 Study the internal structure of the eye below and answer the questions that follow.



The internal structure of the eye

- 6.1.1 Identify structures **1** to **10**. (10)
- 6.1.2 Discuss what happens to structures **4** and **6** if the person looks in the direction of the sun. (5)
- 6.1.3 How do structures **5** and **8** differ from each other and why? (4)
- 6.1.4 To which lobe in the brain is structure **13** connected? (2)
- 6.1.5 (a) Which receptors are only found on structure **11**?
 (b) Which receptors are found on the rest of structure **10**?
 (c) What is the function of the receptors mentioned in Question 6.1.5 (b)?
 (d) Name the substance that is necessary in our diet to ensure that the receptors mentioned in Question 6.1.5 (b), work properly. (4)
- 6.2 Study the internal structure of the ear below and answer the questions that follow.



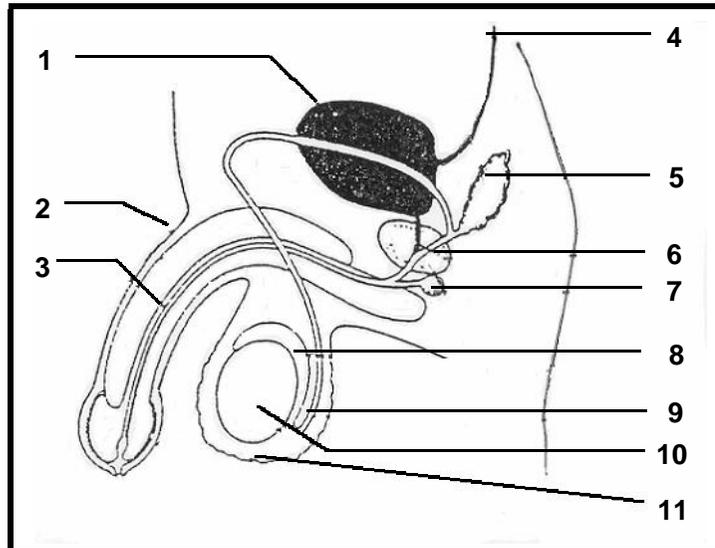
The internal structure of the ear

- 6.2.1 Write down the **numbers** and **names** of THREE membranes that cover openings in the middle ear. (6)
- 6.2.2 (a) Give the names of the THREE smallest bones of the body situated in the ear. (3)
- (b) Give the collective name for these three bones. (2)
- 6.2.3 Identify structures **1** and **9** and give the functions of each structure. (4)
- 6.2.4 Name the TWO types of liquid found in the inner ear. (2)
- 6.2.5 Why can it lead to temporary deafness if a person is hit on the ear? (2)
- 6.2.6 To which part of the brain does the nerve numbered **7** conduct impulses that come from
- (a) structure **6**?
- (b) structure **8**? (2)
- 6.2.7 (a) Identify structure **8**.
- (b) Name the receptor found in structure **8**.
- (c) What is the function of the receptor identified in Question 6.2.7 (b)? (4)

[50]

QUESTION 7

7.1 Study the diagram of the male reproductive system below and answer the questions that follow.



Male reproductive system

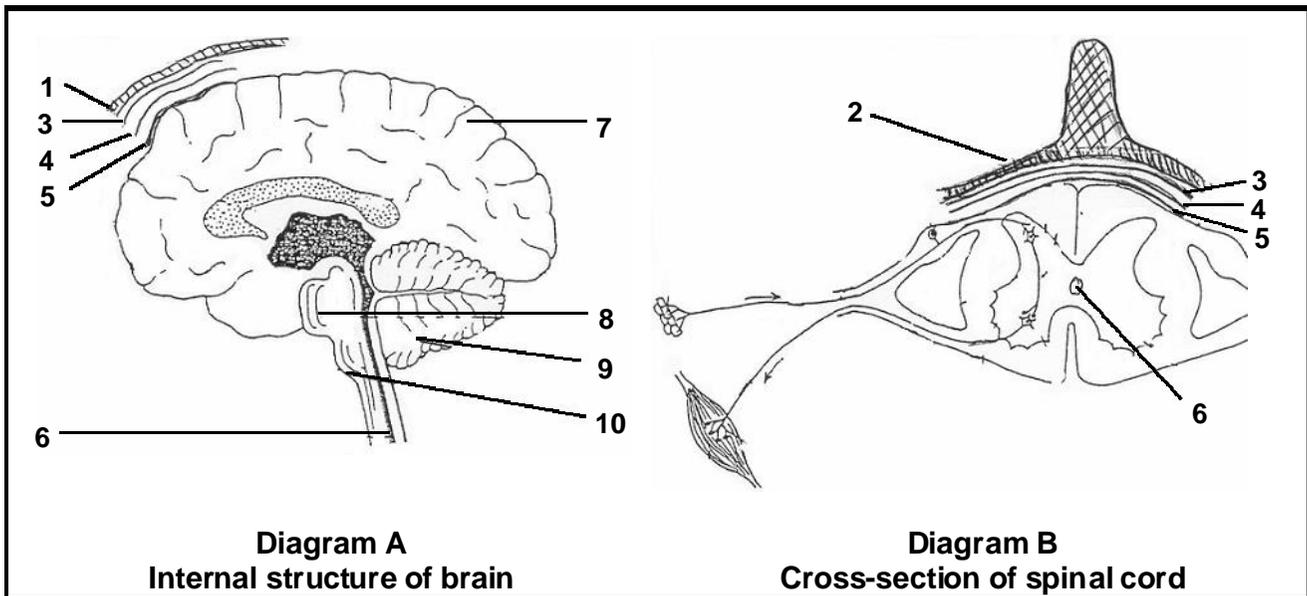
- 7.1.1 Label structures 1 to 11. (11)
- 7.1.2 Write down the **numbers** of the structures involved with the storage and transport of urine. (3)
- 7.1.3 (a) Give the **numbers** and names of the THREE glands that each secretes a substance that forms part of the semen. (3)
- (b) Name THREE constituents of semen, except for sperms, as well as the function of each substance. (6)
- 7.1.4 Draw a neat, labelled diagram of the female reproductive system. Give the sketch a suitable heading. (7)
- 7.1.5 Name the parts of the male / female reproductive systems that are responsible for the following function:
 - (a) Transport of urine out of the body
 - (b) The blastocyst implants in this layer
 - (c) The male copulatory organ
 - (d) The structure responsible for temperature regulation to ensure normal spermatogenesis
 - (e) The structure into which the Graafian follicle develops, should fertilization take place (5)

- 7.2 7.2.1 Name FOUR ways in which the human body can lose heat. (4)
- 7.2.2 Which one of the four ways of heat loss occurs at the sweat gland? (1)
- 7.2.3 (a) Name the receptors that detect low temperatures (cold) in the skin. (1)
- (b) What is normal body temperature? (1)
- (c) Discuss the ways in which the skin prevents heat loss on a cold day. (8)
- [50]**

QUESTION 8

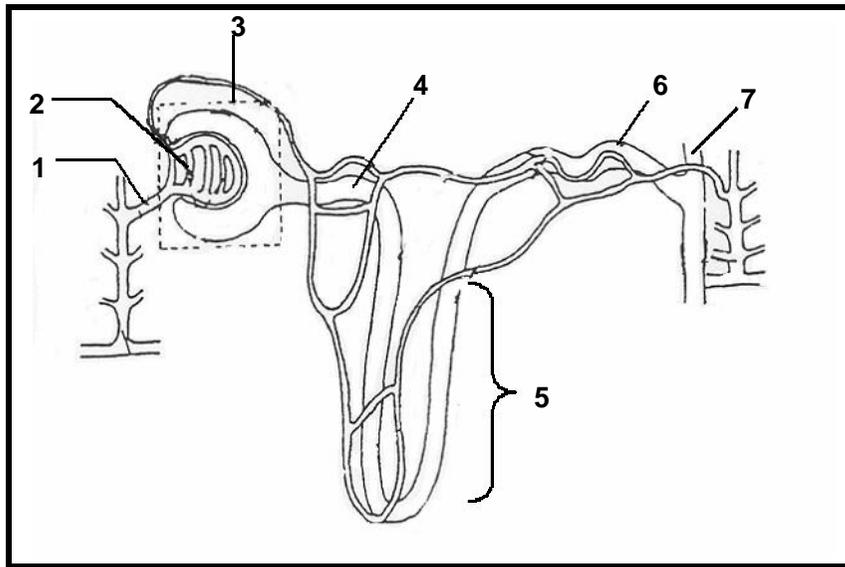
Diagram A represents the internal structure of the brain.

Diagram B represents the cross-section of the spinal cord.



- 8.1 Identify numbers 6 to 10 in **Diagram A**. (5)
- 8.2 8.2.1 Write down the names of the THREE membranes indicated by numbers 3, 4 and 5 in diagrams A and B. (3)
- 8.2.2 Which parts of the skeleton are represented by numbers 1 and 2 respectively? (2)
- 8.2.3 (a) Identify the space and fluid between numbers 3 and 4. (2)
- (b) Discuss the functions of the fluid mentioned in Question 8.2.3 (a) in detail. (5)
- (c) Write down the number where this fluid can also be found. (2)

- 8.3 8.3.1 State in point form the pathway of an impulse from the receptor until a reaction takes place. (8)
- 8.3.2 (a) How does a reflex action differ from a normal reaction? (2)
- (b) What is the purpose of a reflex action? (2)
- (c) Name TWO examples of unconditioned reflex actions. (2)
- 8.4 Study the diagram below of the nephron of a kidney and answer the questions that follow.



The nephron of the kidney

- 8.4.1 Identify structures 1 to 7. (7)
- 8.4.2 How do structures 1 and 2 differ? Give a reason for this difference. (2)
- 8.4.3 What process takes place in structure 5? (1)
- 8.4.4 (a) What are the fluids in structures 3 and 7 respectively called? (2)
- (b) Which useful substances are present in the fluid in part 3 that are NOT present in part 7? (2)
- 8.4.5 Which substances stay behind in the blood at structure 3? Give a reason for your answer. (3)

[50]

TOTAL FOR SECTION B: [200]

TOTAL: 300