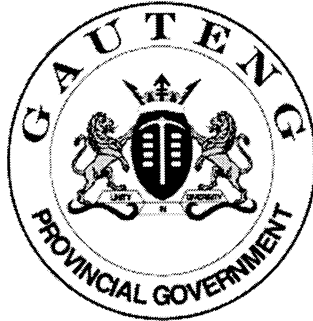


**SENIOR CERTIFICATE
EXAMINATION
SENIORSERTIFIKAAT-EKSAMEN**



**FEBRUARY / FEBRUARIE
MARCH / MAART**

2005

PHYSIOLOGY

FISIOLOGIE

HG

307-1/0

PHYSIOLOGY HG



**18 pages
18 bladsye**

X05



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GAUTENGSE DEPARTEMENT VAN ONDERWYS
SENIORSERTIFIKAAT-EKSAMEN

FISIOLOGIE HG

TYD: 3 uur

PUNTE: 300

INSTRUKSIES:

- Die vraestel bestaan uit Afdelings A, B en C.

TOTAAL AFDELING A: 90
TOTAAL AFDELING B: 160
TOTAAL AFDELING C: 50

- In Afdelings A en B is al die vrae VERPLIGTEND.
 - Beantwoord slegs EEN vraag uit Afdeling C.
 - Beantwoord Vraag 1 (meervoudige keusevrae) op die **antwoordblad** aan die **binnekant van die omslag** van jou **antwoordboek**.
 - Nommer jou antwoorde in ooreenstemming met die vraestel.
-
-

AFDELING A
VERPLIGTEND

VRAAG 1
MEERVOUDIGE KEUSEVRAE

Vier moontlikhede word as antwoorde op die volgende vrae verskaf. Dui die korrekte antwoord met 'n kruis (**X**) oor die toepaslike letter op die **antwoordblad** aan die **binnekant van die omslag** van jou **antwoordboek** aan.

VOORBEELD: Speeksel word afgeskei in die _____ .

- A. mond
- B. esofagus
- C. maag
- D. duodenum

ANTWOORD:

A	B	C	D
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GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION

PHYSIOLOGY HG

TIME: 3 hours

MARKS: 300

INSTRUCTIONS:

- The question paper consists of Sections A, B and C.

TOTAL SECTION A: 90
TOTAL SECTION B: 160
TOTAL SECTION C: 50

- In Sections A and B all questions are **COMPULSORY**.
 - Answer **ONE** question from Section C.
 - Answer Question 1 (multiple-choice questions) on the **answer sheet** on the **inside cover** of your **answer book**.
 - Number your answers in accordance with the question paper.
-
-

SECTION A
COMPULSORY

QUESTION 1
MULTIPLE-CHOICE QUESTIONS

Four possibilities are given as answers to each of the following questions. Indicate the correct answer, by marking the relevant letter with a cross (X) on the **answer sheet** on the **inside cover** of your **answer book**.

EXAMPLE: Saliva is secreted in the _____ .

- A. mouth
- B. oesophagus
- C. stomach
- D. duodenum

ANSWER:

A	B	C	D
--------------	---	---	---

1.1 Selle met 'n endokriene funksie in die testis is _____ .

- A. Selle van Cowper
- B. Selle van Leydig
- C. Selle van Schwann
- D. Selle van Sertoli

1.2 Uriensuur is afkomstig van _____ .

- A. deaminasie van aminosure
- B. afgebreekte nukleïensure (DNA en RNA)
- C. rooibloedselle wat afgebreek word in die milt
- D. afbreek van fosfokreatien in die spiere

1.3 Watter van die produkte in die tabel is die resultaat van meïotiese verdeling van 'n primêre spermatosiet (diploïedegetal = $2n$)?

Tabel 1.3: Ploïede getal van spermatosiete

	Getal sperms gevorm	Ploïedgetal van elke sperm
A	1	n
B	4	n
C	4	$2n$
D	2	n

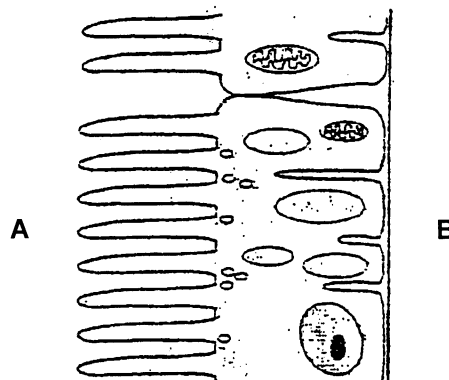
1.4 Watter metode sal verhoed dat die embryo in 'n fetus sal ontwikkel?

- A. Manlike kondoom
- B. Oggend-agterna-pil
- C. Vroulike kondoom
- D. Voorbehoedpil

1.5 Die onderstaande skets stel selle van die proksimale kronkelbuis voor. Watter kombinasie is korrek?

- A. **B** is die medulla-gebied van 'n nefron.
- B. **A** is die lumen wat ammoniak afskei.
- C. Glomerulêre filtraat word by **B** aangetref.
- D. **A** is die lumen waaruit vitamie selektief geherabsorbeer word.

Fig. 1.5: Selle van die proksimale kronkelbuis



1.1 Cells with an endocrine function in the testis are _____ .

- A. Cowper's cells
- B. Cells of Leydig
- C. Cells of Schwann
- D. Cells of Sertoli

1.2 Uric acid is derived from the _____ .

- A. deamination of amino acids
- B. breakdown of nucleic acids (DNA and RNA)
- C. breakdown of erythrocytes in the spleen
- D. breakdown of phosphocreatine in the muscles

1.3 Which of the products in the table is the result of meiotic division of the primary spermatocyte (diploid number = $2n$)?

Table 1.3: Ploid number of spermatocytes

	Number of spermatozoa produced	Ploid number of each sperm
A	1	n
B	4	n
C	4	$2n$
D	2	n

1.4 Which method will prevent the embryo from developing into a foetus?

- A. Male condom
- B. Morning-after pill
- C. Female condom
- D. Birth control pill

1.5 In the diagram below cells of the proximal convoluted tubules are shown. Which combination is correct?

- A. **B** is the medulla area of a nephron.
- B. **A** is the lumen which secretes ammonia.
- C. Glomerular filtrate is found at **B**.
- D. **A** is the lumen from where vitamins are selectively reabsorbed.

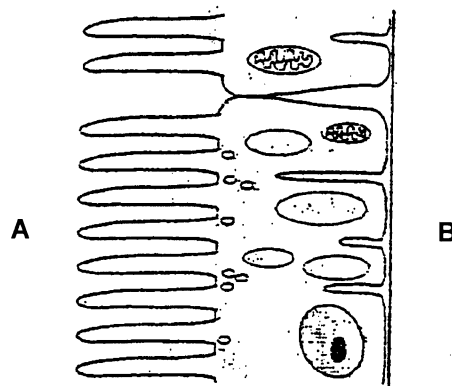


Fig. 1.5: Cells of proximal convoluted tubules

- 1.6 Watter van die volgende kombinasies waar weefselvloeistof 'n rol speel, is onontbeerlik vir die normale funksionering van selle?
1. pH regulering
 2. Waterkonsentrasie
 3. Suurstofvoorsiening
 4. Vervoer van koolstofdiksied
 5. Regulering van temperatuur
- A. 3, 4, 5
 B. 1, 2, 4 en 5
 C. 1, 4, 5
 D. 1, 2, 3, 4, en 5
- 1.7 Watter vitamien word deur steroïede in die vel geproduseer?
- A. Vitamien D
 B. Vitamien C
 C. Vitamien B
 D. Vitamien A
- 1.8 Watter een van die volgende strukture beskerm **nie** die nier nie?
- A. Veselagtige nierkapsel
 B. Adipose weefsel
 C. Swewende ribbes
 D. Nierpapil
- 1.9 Die onderstaande grafiek toon die volume urine wat uitgeskei word deur 'n persoon wat 1 000 cm³ gedistilleerde water gedrink het. Die persoon se urine is versamel direk voordat hy/sy die water gedrink het en daarna met halfuur-intervalle oor die volgende 4 uur. Hoe lank het dit geneem vir die urienproduksie om tot die normale volume vir daardie persoon terug te keer?
- A. 1 uur
 B. 3½ uur
 C. 2½ uur
 D. 4 uur

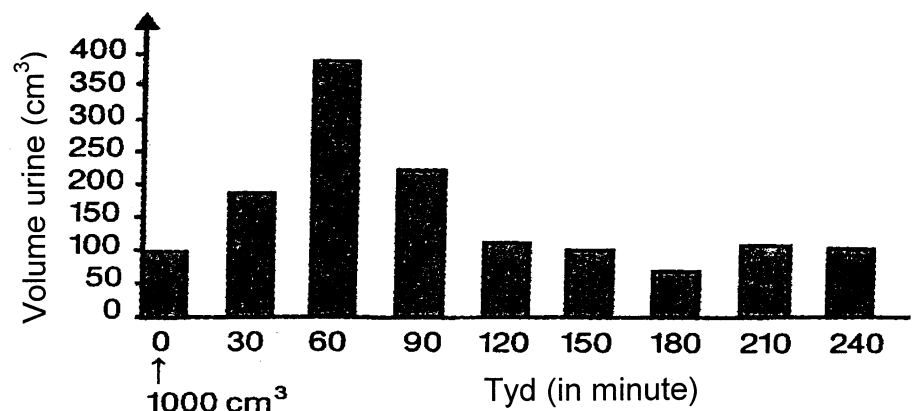


Fig. 1.9: Urine uitgeskei deur 'n persoon nadat 1 ℓ water gedrink is

1.6 Which of the following combinations where tissue fluid plays a role is indispensable for the normal functioning of cells?

1. pH regulation
2. Water concentration
3. Oxygen release
4. Transport of carbon dioxide
5. Temperature regulation

- A. 3, 4, 5
- B. 1, 2, 4 and 5
- C. 1, 4, 5
- D. 1, 2, 3, 4, and 5

1.7 Which vitamin is produced by steroids in the skin?

- A. Vitamin D
- B. Vitamin C
- C. Vitamin B
- D. Vitamin A

1.8 Which one of the following structures does **not** protect the kidney?

- A. Fibrous renal capsule
- B. Adipose tissue
- C. Floating ribs
- D. Nephric papilla

1.9 The graph below shows the volume of urine that was excreted by a person who drank 1 000 cm³ distilled water. The person's urine was collected just before he/she drank the water and then every half hour for the next 4 hours thereafter. How long did it take for the production of urine to reach the normal volume for that person?

- A. 1 hour
- B. 3½ hours
- C. 2½ hours
- D. 4 hours

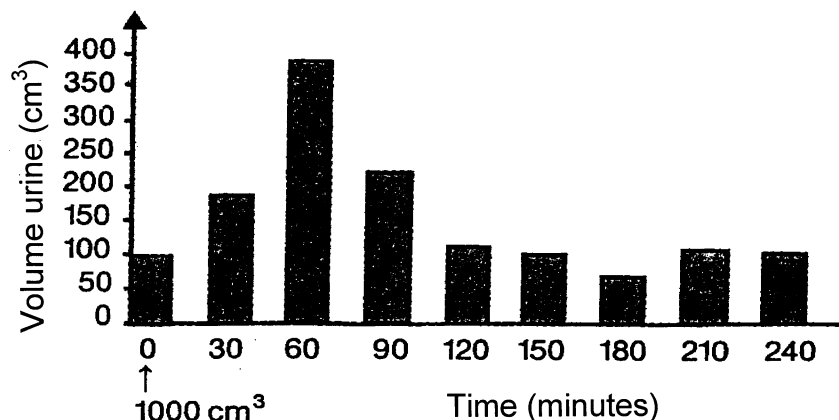


Fig. 1.9: Urine excreted by one person after 1 l of water was consumed

Vrae 1.10 tot 1.12 is gebaseer op die onderstaande diagram wat 'n snit deur 'n deel van die liggaampie van Malpighi voorstel.

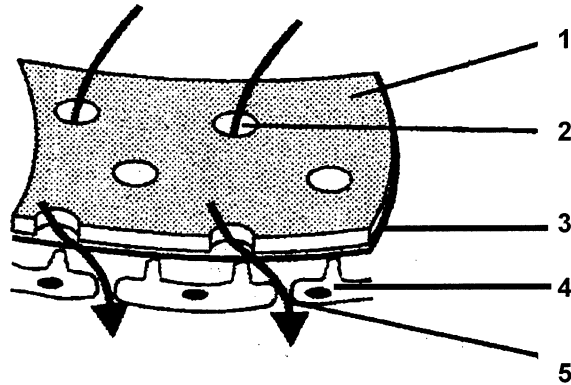


Fig. 1.10: Dwarsnit deur die liggaampie van Malpighi in die nier

1.10 Noem 'n proses wat in strukture 2 en 4 plaasvind.

- A. Tubulêre herabsorpsie
- B. Buissekresie
- C. Ultrafiltrasie
- D. Osmoregulering

1.11 Watter van die volgende stowwe kan by nommer 5 voorkom?

- A. Vitamien C, glukose, proteïene en suurstof
- B. Vitamien B, glukose, natriumione en water
- C. Kreatinien, uriensuur en eritrosiete
- D. Plasmaproteïene, eritrosiete, witbloedselle en koolsuurgas

1.12 Wanneer die dun membraan nommer 3 beskadig is, kan dit lei tot _____.

- A. diabetes mellitus
- B. geelsug (hepatitis)
- C. bloed in die urine
- D. swangerskap

Questions 1.10 to 1.12 are based on the diagram below which represents a section through the Malpighian body.

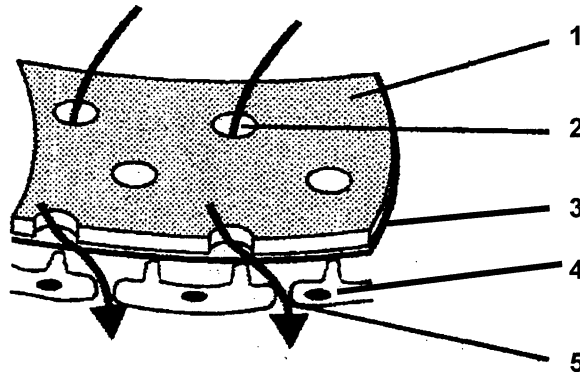


Fig. 1.10: Cross section through the Malpighian body in the kidney

- 1.10 Name a process that occurs in the structures labelled 2 and 4.
- A. Tubular reabsorption
 - B. Tubular secretion
 - C. Ultrafiltration
 - D. Osmoregulation
- 1.11 Which of the following substances can be present at no.5?
- A. Vitamin C, glucose, proteins and oxygen
 - B. Vitamin B, glucose, sodium ions and water
 - C. Creatinine, uric acid and erythrocytes
 - D. Plasma proteins, erythrocytes, white blood cells and carbon dioxide
- 1.12 If the thin membrane no. 3 is damaged, it can cause _____ .
- A. diabetes mellitus
 - B. jaundice (hepatitis)
 - C. blood in the urine
 - D. pregnancy

Vrae 1.13 tot 1.15 is gebaseer op die onderstaande diagram van 'n lengtesnit deur die serebrum.

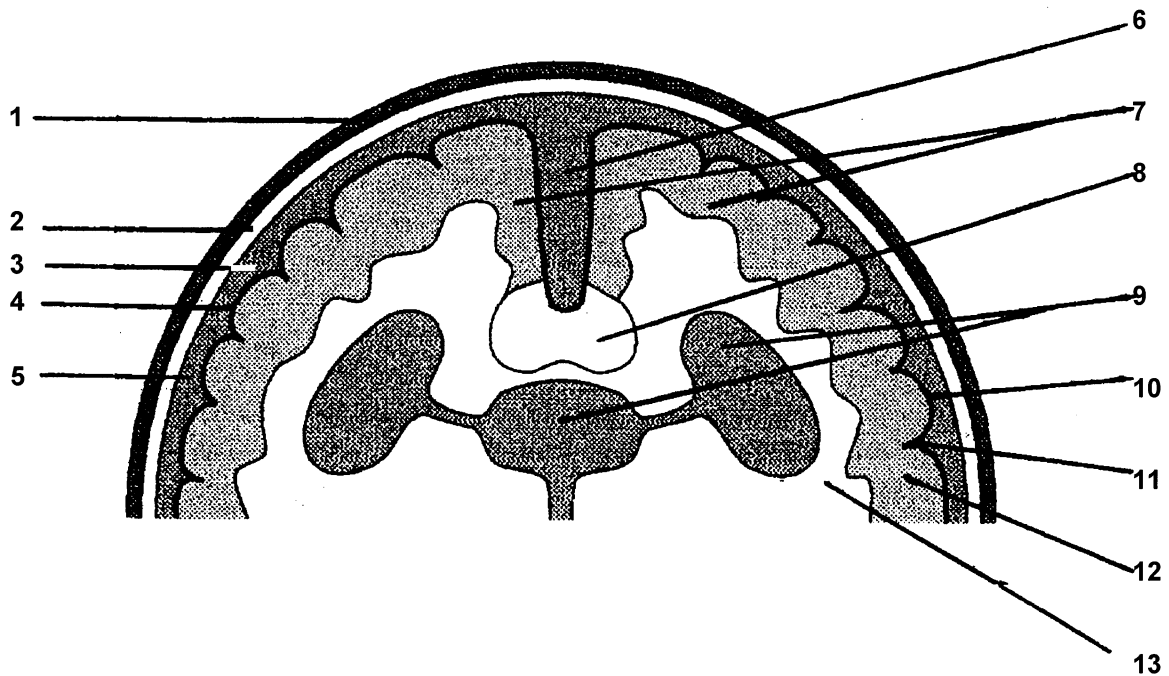


Fig. 1.13: Lengtesnit deur die serebrale korteks

- 1.13 Watter van die onderstaande kombinasies stel die dele voor wat uit vetagtige, gemiëlineerde senuweevesels bestaan?
- A. Slegs 8
 B. 8 en 13
 C. 7 en 12
 D. 6 en 9
- 1.14 Nommer 6 en 10 is die _____.
- A. sentrale sulkus en 'n girus
 B. longitudinale sulkus en 'n girus
 C. girus van Rolando en 'n sulkus
 D. aquaduct van Sylvius en die dura mater
- 1.15 Die vloeistof wat by nommer 3 voorkom, word ook in _____.
- A. no. 6 aangetref en bevat ammoniak
 B. no. 9 aangetref en verwyder metaboliese afvalstowwe
 C. no. 8 aangetref en tree op as 'n skokkussing
 D. no. 9 aangetref en veroorsaak die uitdroging van selle van die sentrale senustelsel

Questions 1.13 to 1.15 are based on the diagram below which represents a longitudinal section through the cerebrum.

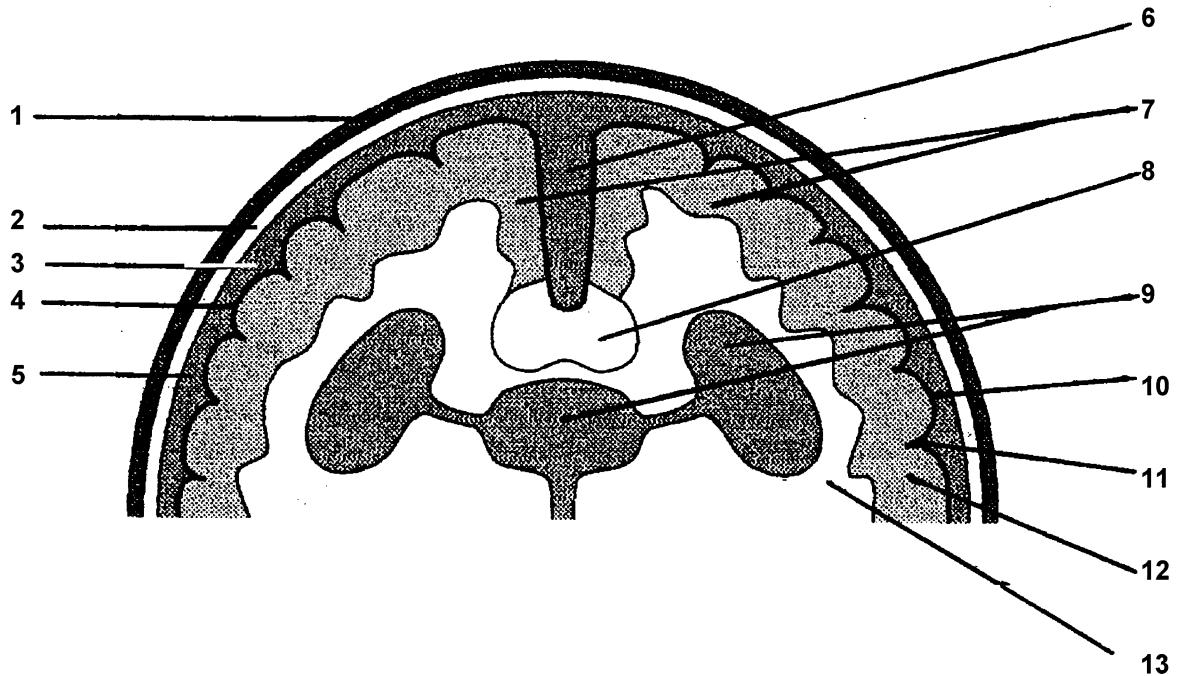


Fig. 1.13: Longitudinal section through the cerebral cortex

- 1.13 Which of the following combinations shows the parts that consist of fatty myelinated nerve fibres?
- 8 only
 - 8 and 13
 - 7 and 12
 - 6 and 9
- 1.14 Numbers 6 and 10 are the _____.
- central sulcus and a gyrus
 - longitudinal sulcus and a gyrus
 - gyrus of Rolando and a sulcus
 - aqueduct of Sylvius and the dura mater
- 1.15 The fluid that occurs in no. 3 is also found in _____.
- no. 6 and contains ammonia
 - no. 9 and removes metabolic waste products
 - no. 8 and acts as a cushion against shock
 - no. 9 and dries out the cells of the central nervous system

- 1.16 Watter een van die onderstaande stellings is korrek?
- A. By die parasimpatiese senuweestelsel is die ganglia geleë in die wande van die effektor.
 - B. By die simpatiese senuweestelsel is die ganglia ver van die rugmurg af geleë.
 - C. By die parasimpatiese senuweestelsel is die ganglia naby aan die rugmurg geleë.
 - D. Preganglioniese vesels van die parasimpatiese senuweestelsel is kort.
- 1.17 Die linkerkant van die gesig van 'n jong man is verlam nadat hy 'n beroerte-aanval gehad het. Die rede hiervoor is dat _____.
- A. die linkerlob van die serebellum beskadig is
 - B. die regter motoriese area van sy serebrale korteks 'n tekort aan suurstof en voedingstowwe ondervind het
 - C. die linker motoriese area van sy serebrale korteks 'n tekort aan suurstof en voedingstowwe ondervind het
 - D. die regterlob van die serebellum beskadig is
- 1.18 Groepies ribosome in die sitoplasma van die selliggaam van 'n monopolêre neuron word die _____ genoem.
- A. aksonheuwels
 - B. Schwann-selle
 - C. Nissl -liggaampies
 - D. neuroglia

In die onderstaande diagram word die lens, iris en retina van die menslike oog uitgebeeld. Vrae 1.19 tot 1.21 is op dié diagram gebaseer.

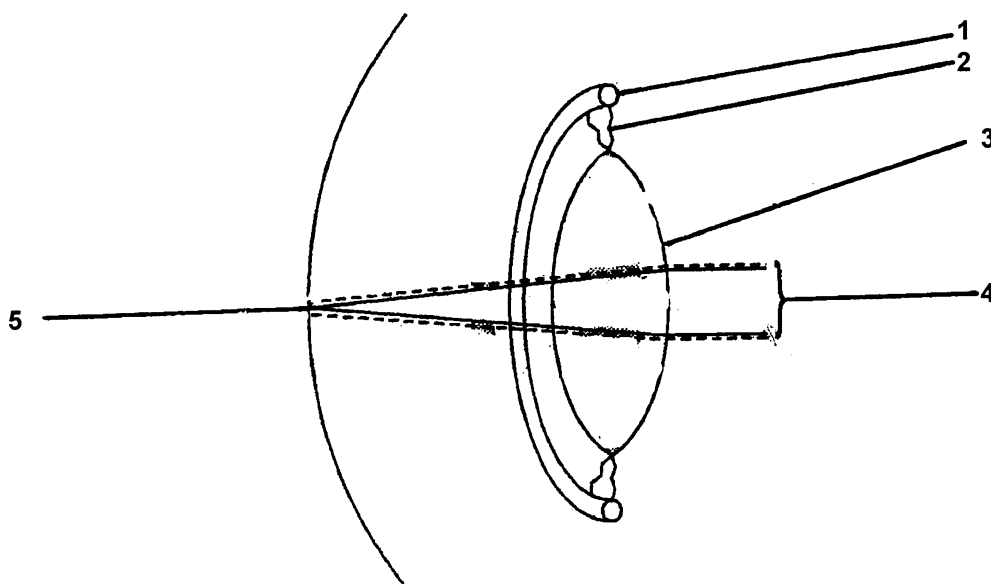


Fig. 1.19: Lens, iris en retina van die menslike oog

- 1.16 Which one of the following statements is correct?
- A. The ganglia of the parasympathetic nervous system are situated in the wall of the effector.
 - B. The ganglia of the sympathetic nervous system are situated far from the spinal cord.
 - C. The ganglia of the parasympathetic nervous system are situated close to the spinal cord.
 - D. The pre-ganglionic fibres of the parasympathetic nervous system are short.
- 1.17 The left side of a young man's face was paralysed by a stroke. The reason for this is that _____.
- A. the left lobe of the cerebellum was damaged
 - B. the right motor area of his cerebral cortex was deprived of oxygen and nutrients
 - C. the left motor area of his cerebral cortex was deprived of oxygen and nutrients
 - D. the right lobe of the cerebellum was damaged
- 1.18 Groups of ribosomes in the cytoplasm of the cell body of a monopolar neuron are called _____.
- A. axon hillocks
 - B. Schwann cells
 - C. Nissl bodies
 - D. neuroglia

In the diagram below, the lens, iris and retina of a human eye are shown. Questions 1.19 to 1.21 are based on this diagram.

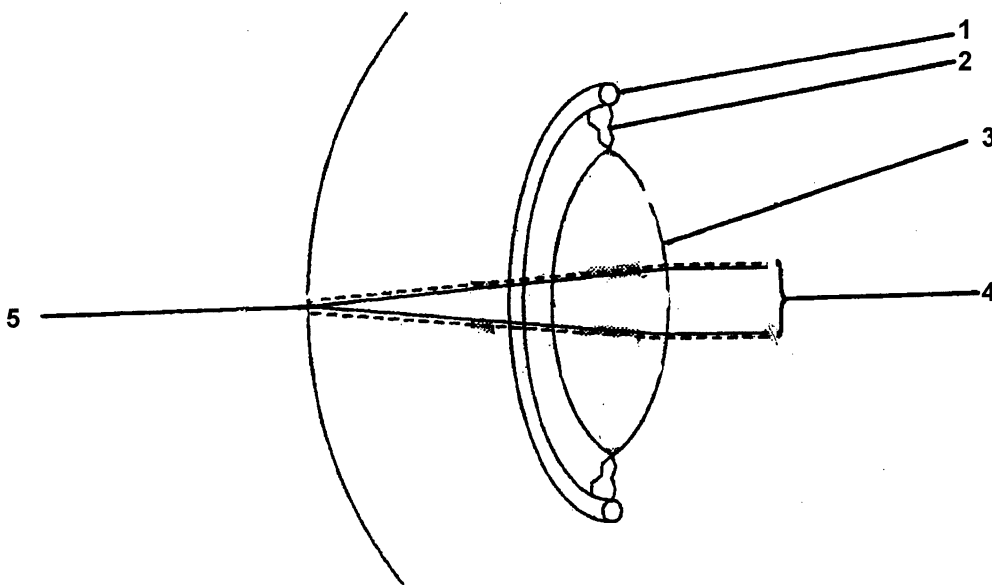


Fig. 1.19: Lens, iris and retina of the human eye

- 1.19 By 'n diabeet wat ook 'n kettingroker is, is nommer 3 gewoonlik verhard en taamlik verdof. Die toestand staan bekend as _____ .
- A. gloukoom
 - B. astigmatisme
 - C. akromatose
 - D. 'n katarak
- 1.20 Kies die korrekte kombinasie. Die beeld op nommer 5 sal _____ .
- i. 'n egte beeld wees
 - ii. groter wees as die voorwerp
 - iii. kleiner wees as die voorwerp
 - iv. regop en helder wees
 - v. onderstebo en van links na regs omgedraai wees
- A. (i), (ii) en (v)
 - B. (i), (iii) en (v)
 - C. (iii) en (v)
 - D. (i), (iii) en (iv)
- 1.21 Wanneer lig deur no. 3 beweeg, word dit _____ gerefrakteer.
- A. 1 maal
 - B. 2 maal
 - C. 3 maal
 - D. glad nie
- 1.22 Otoliete kom voor in die _____ .
- A. ampulla
 - B. kupula
 - C. makula
 - D. halfsirkelvormige kanaal
- 1.23 'n Werker stap in 'n fabriek in en 'n skerp reuk veroorsaak dat hy vinnig sy neus toedruk. Die reseptore wat in dié geval funksioneer, is die _____ .
- A. orgaan van Corti, wat bipolarêre neurone in die scala media is
 - B. olfaktoriese selle, wat bipolarêre neurone tussen die turbinaatbene is
 - C. olfaktoriese selle, wat monopolêre neurone tussen die kliere van Bowman is
 - D. olfaktoriese selle, wat bipolarêre neurone tussen die kliere van Bowman is
- 1.24 Sere op die geslagsdele en blindheid is tekens (simptome) van die volgende siekte:
- A. Sifilis
 - B. Geslagsherpes
 - C. Gonoree
 - D. EARS

- 1.19 In a person with diabetes, who is also a chain smoker, number 3 usually hardens and becomes cloudy. The defect is known as _____ .
- A. glaucoma
 - B. astigmatism
 - C. acromatosis
 - D. a cataract
- 1.20 Choose the correct combination. The image on number 5 will be _____ .
- i. a real image
 - ii. bigger than the object
 - iii. smaller than the object
 - iv. erect and bright
 - v. upside down and reversed from left to right
- A. (i), (ii) and (v)
 - B. (i), (iii) and (v)
 - C. (iii) and (v)
 - D. (i), (iii) and (iv)
- 1.21 When light passes through number 3, it will be refracted _____ .
- A. once
 - B. twice
 - C. three times
 - D. not at all.
- 1.22 Otoliths are found in the _____ .
- A. ampulla
 - B. cupula
 - C. maculae
 - D. semicircular canal
- 1.23 A worker walks into a factory and a sharp smell causes him to cover his nose. The receptors functioning in this area are _____ .
- A. organs of Corti, which are bipolar neurons in the scala media
 - B. olfactory cells, which are bipolar neurons in the turbinate bones
 - C. olfactory cells, which are monopolar neurons in between the glands of Bowman
 - D. olfactory cells, which are bipolar neurons in between the glands of Bowman
- 1.24 Sores on the sex organs and blindness are signs of the following disease:
- A. Syphilis
 - B. Genital herpes
 - C. Gonorrhoea
 - D. SARS

1.25 Die pad van 'n senuwee-impuls om 12:00 deur die oog is soos volg:

- A. Keëltjies → bipolarêre neuron → ganglion-sel → optiese senuwee → optiese chiasma (kruising) → oksipitale lob van serebrum
- B. Stafies → keëltjies → bipolarêre neuron → ganglion-sel → optiese senuwee → optiese chiasma (kruising) → oksipitale lob van serebrum
- C. Keëltjies → ganglionsel → bipolarêre neuron → optiese senuwee → optiese chiasma → oksipitale lob van serebrum
- D. Keëltjies → bipolarêre neuron → ganglionsel → optiese chiasma → optiese senuwee → oksipitale lob van serebrum

25 x 2 = [50]

VRAAG 2

Gee die korrekte **fisiologiese term** vir elk van die volgende omskrywings.

- 2.1 Die vermoë van die lens in die menslike oog om op voorwerpe verder as 6 meter te fokus
- 2.2 Reseptore in die menslike liggaam wat gevoelig is vir swaartekrag en die posisie van die hoof in die ruimte waarneem
- 2.3 Die gespesialiseerde plaveiselepiteel-selle in die binnewand van die kapsel van Bowman wat 'n noue assosiasie met die glomerulus vorm
- 2.4 Die reseptore wat gevoelig is vir veranderinge in die spanning van spiere en tendons
- 2.5 Die handhawing en instandhouding van die interne omgewing van enige sel in die liggaam
- 2.6 Die gebreksiekte (abnormaliteit) in kinders vanweë die onderafskeiding van tiroksien
- 2.7 Die slymlaag wat die uterus uitvoer
- 2.8 Vernouing van bloedvate in die vel tydens simpatiese stimulasie
- 2.9 Die area in die sentrale senustelsel waar die senuvesels tussen die rugmurg en die brein kruis
- 2.10 Die ensiem wat deur die niere afgeskei word en wat 'n rol speel in die beheer van bloeddruk

10 x 2 = [20]

1.25 The pathway of a nerve impulse through the eye at noon is as follows:

- A. Cones → bipolar neuron → ganglion cell → optic nerve → optic chiasma → occipital lobe of the serebrum
- B. Rods → cones → bipolar neuron → ganglion cell → optic nerve → optic chiasma → occipital lobe of the serebrum
- C. Cones → ganglion cell → bipolar neuron → optic nerve → optic chiasma → occipital lobe of the serebrum
- D. Cones → bipolar neuron → ganglion cell → optic chiasma → optic nerve → occipital lobe of the serebrum

25 x 2 = [50]

QUESTION 2

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

- 2.1 The ability of the lens in the human eye to focus on objects further than 6 metres
- 2.2 Receptors in the human body that are sensitive to gravity and register the position of the head in space
- 2.3 The specialised squamous epithelial cells on the inner wall of the Bowman's capsule that have a close association with the glomerulus
- 2.4 Receptors sensitive to changes in the tension of muscles and tendons
- 2.5 Maintenance of the constant internal environment of any cell in the body
- 2.6 The abnormality in children which result from hyopsecretion of thyroxine
- 2.7 The mucous layer lining the uterus
- 2.8 Contraction of the blood vessels in the skin during sympathetic stimulation
- 2.9 The area of the central nervous system where nerve fibres between the spinal cord and the brain cross over
- 2.10 The enzyme secreted by the kidneys which plays a role in regulating blood pressure

10 x 2 = [20]

VRAAG 3

Dui aan of die beskrywing in **KOLOM 1** op **slegs A**, **slegs B**, **A en B** of op **geeneen** van die items in **KOLOM 2** nie van toepassing is.

Dui jou keuse op die volgende manier aan:

A indien slegs A betrekking het op die stelling

B indien slegs B betrekking het op die stelling

A en B indien beide A en B betrekking het op die stelling

Geen indien nie A of B betrekking het op die stelling nie

KOLOM 1	KOLOM 2
1. Beskerm die vel teen meganiese besering en binnedring van kieme	A. Melanien B. Keratien
2. Verhoogde sweetproduksie word hierdeur veroorsaak	A. Lae omgewingstemperatuur B. Diarree
3. Speel 'n rol in die osmoregulering van die nier	A. Aldosteroon B. Natrium-ione
4. Bind die serebellum aan ander dele van die brein	A. Vermis B. Corpus callosum
5. Beheer die biologiese dryfkrag van aggressie	A. Hipotalamus B. Talamus

[5]

QUESTION 3

Indicate if the descriptions in **COLUMN 1** is applicable to **only A**, **only B**, **A and B** or **none** of the items in **COLUMN 2**.

Indicate your choice in the following way:

A if only A relates to the statement

B if only B relates to the statement

A and B if both A and B relate to the statement

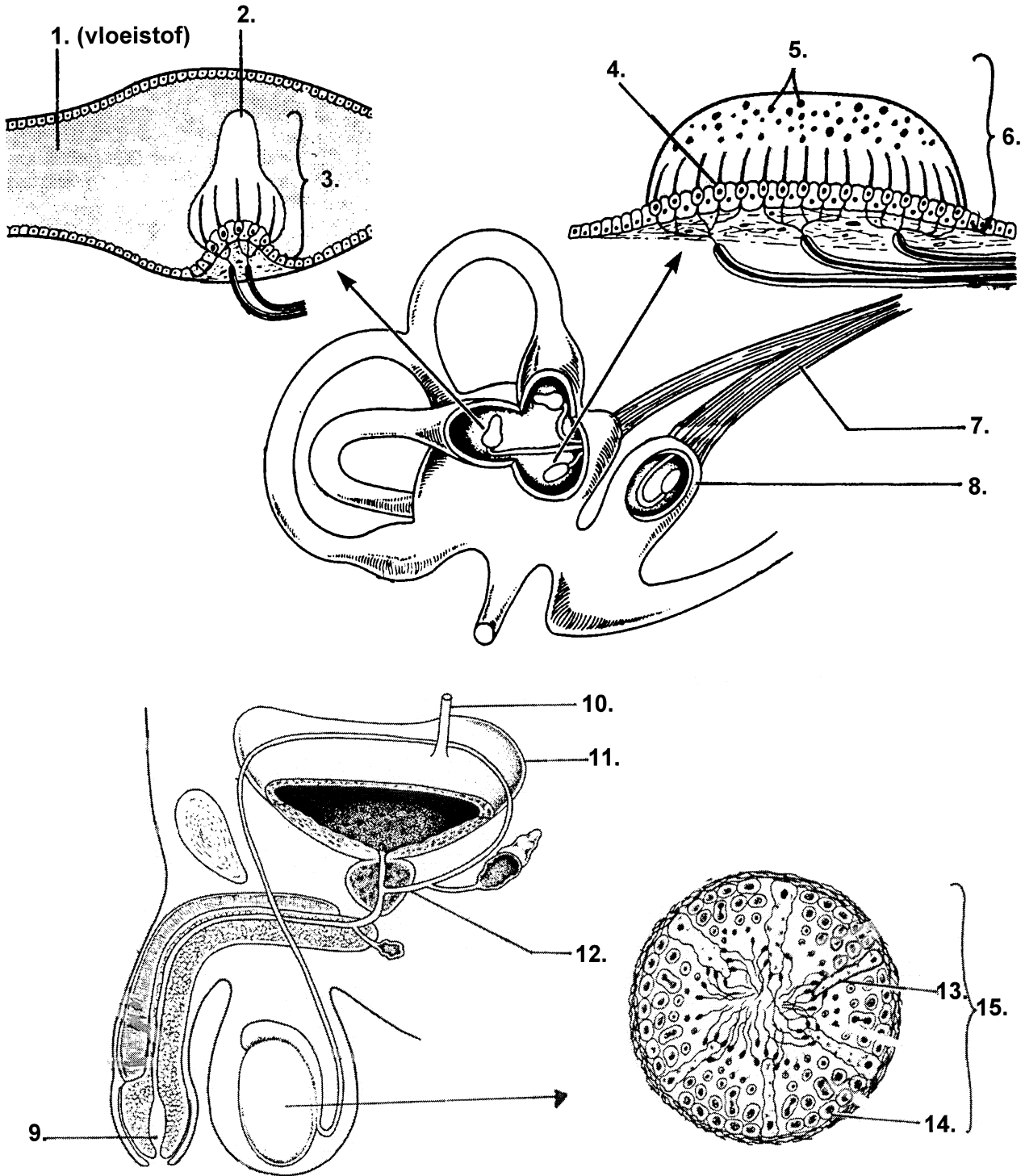
None if neither A nor B relates to the statement

COLUMN 1	COLUMN 2
1. Protects skin against mechanical injury and entry of germs	A. Melanin B. Ceratin
2. Causes an increased sweat production	A. Lowering of environmental temperature B. Diarrhoea
3. Play(s) a role in the osmoregulation of the kidney	A. ADH and Aldosterone B. Sodium ions
4. Connects the cerebellum to other parts of the brain	A. Vermis B. Corpus callosum
5. Controls the biological drive of aggression	A. Hypothalamus B. Thalamus

[5]

VRAAG 4

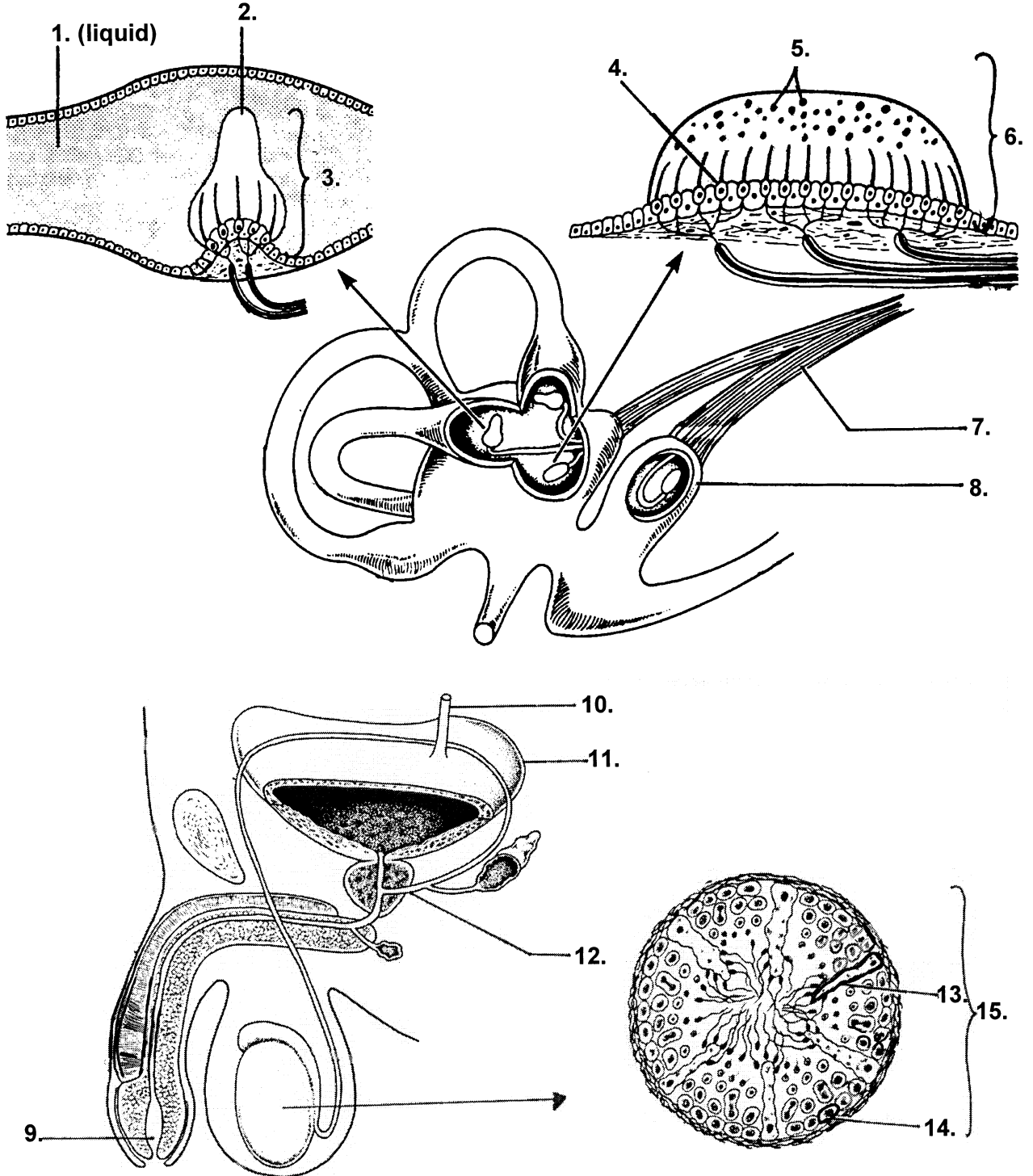
Die meegaande diagramme illustreer sekere menslike organe of dele daarvan. Skryf die naam van die struktuur teenoor die toepaslike nommer in jou antwoordboek neer.



TOTAAL VIR AFDELING A: [15]
[90]

QUESTION 4

The following diagrams represent certain human organs or parts thereof. Write the name of the structure next to the correct number in your answer book.

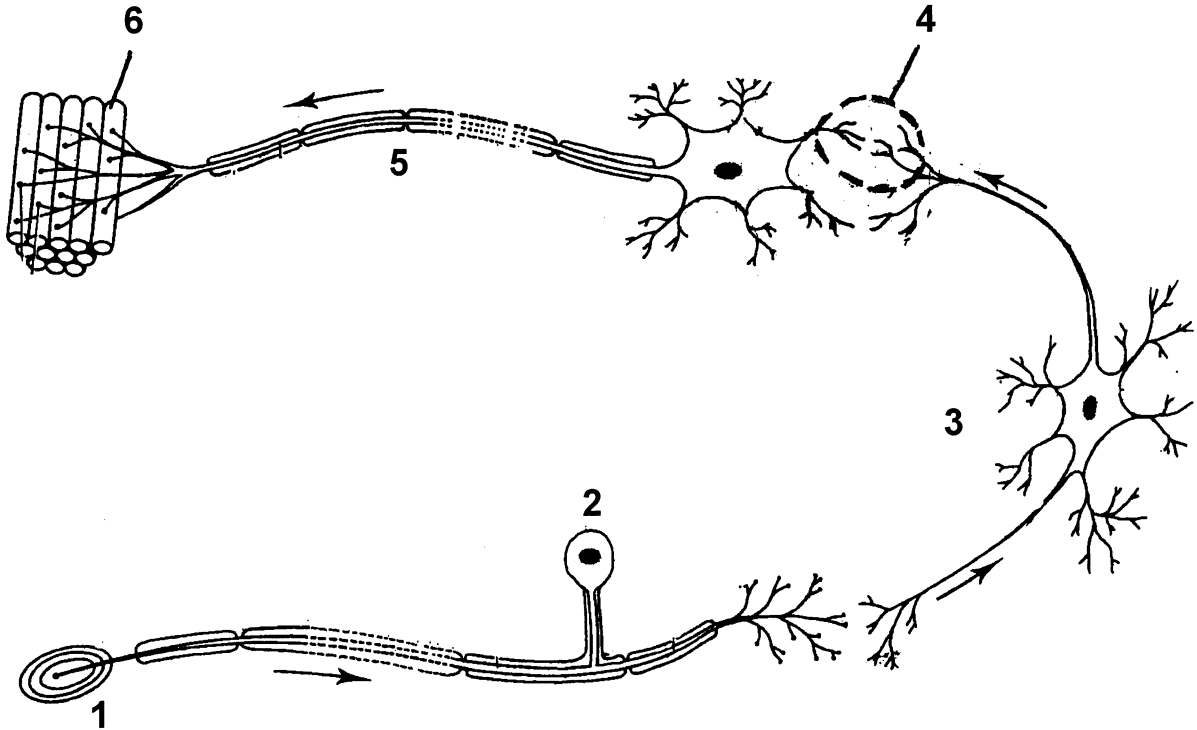


TOTAL FOR SECTION A: (15)
[90]

**AFDELING B
VERPLIGTEND**

VRAAG 5

- 5.1 Die volgende diagram illustreer die verskillende tipes neurone in die menslike liggaam.



- 5.1.1 No.1 in die diagram verteenwoordig sekere tipes reseptore in die menslike liggaam. Die funksie van reseptore is om 'n stimulus om te skakel in 'n impuls. Skryf die name van die reseptore neer wat in elk van die volgende gevalle gestimuleer sal word:

- Wanneer jy jou vinger sny
- Wanneer iemand jou met 'n veer kielie
- Wanneer iemand jou 'n vuishou gee
- Jy die bitter smaak van 'n tablet proe
- Wanneer jy 'n yspak op jou verstuite enkel hou
- Wanneer jy toets of 'n strykyster warm is met jou vinger
- Wanneer jy 'n wetenskapeksperiment doen waartydens witlig deur 'n prisma opgebreek word in die spektrum kleure. (7)

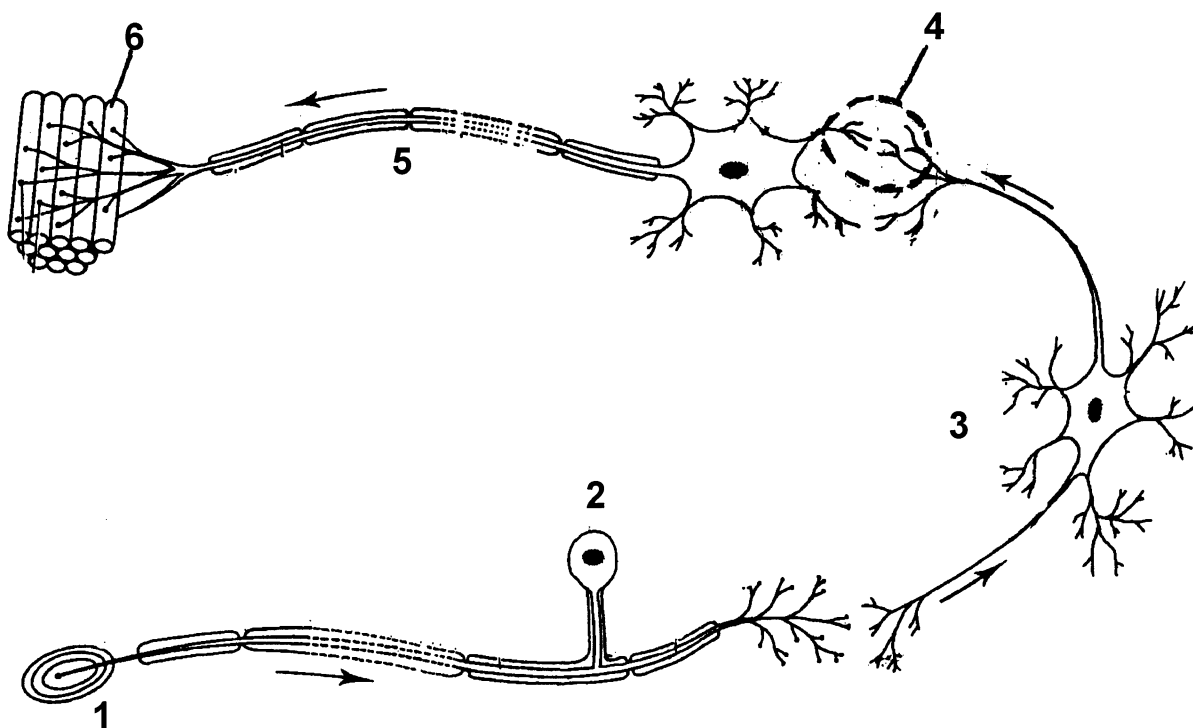
- 5.1.2 (a) Waar in die liggaam kan no. 2 en 3 onderskeidelik geleë wees? (2)
 (b) Identifiseer struktuur 4 en verskaf twee funksies van hierdie struktuur. 1+2=(3)
 (c) Teken 'n netjiese, benoemde diagram van 'n dwarsnit deur die rugmurg. (7)

- 5.1.3 (a) Noem die tipes neurone wat onderskeidelik deur no. 2, 3 en 5 verteenwoordig word. (3)
 (b) Noem die funksie van elke neuron wat in Vraag 5.1.3 (a) genoem word. (3)

**SECTION B
COMPULSORY**

QUESTION 5

5.1 The following diagram illustrates the different types of neurons in the human body.



5.1.1 No.1 in the diagram represents certain types/kinds of receptors in the human body. The function of receptors is to convert stimuli to impulses. Write down the receptors that will be stimulated when you are exposed to the following stimuli:

- Cutting your finger
- Being tickled with a feather
- Being hit by a fist
- Tasting a bitter tablet
- Holding an ice pack to your sprained ankle
- Testing the temperature of a hot iron with your finger
- Doing the science experiment whereby white light is dispersed by a prism into its spectrum of colours. (7)

- 5.1.2 (a) Where in the body can numbers 2 and 3 be situated respectively? (2)
 (b) Identify structure 4 and name two functions of this structure. 1+2=(3)
 (c) Draw a neat, labelled diagram of a cross section through the spinal cord. (7)

- 5.1.3 (a) Name the types of neurons represented by numbers 2, 3 and 5. (3)
 (b) Name the functions of each neuron mentioned in Question 5.1.3 (a). (3)

- 5.1.4 (a) Wat word deur no. 6 verteenwoordig? (1)
 (b) Noem TWEE tipes organe wat die funksie van no. 6 vervul. (2)

5.2 Bespreek die outonome senuweestelsel deur te verwys na die volgende:

- 5.2.1 Die DRIE effektore wat deur die outonome senuweestelsel beheer word (3)
 5.2.2 Die dele van die sentrale senuweestelsel wat die outonome senuweestelsel beheer. (2)
 5.2.3 Die TWEE substelsels van die outonome senuweestelsel en hoe hulle funksioneer (7)

[40]

VRAAG 6

6.1 Die volgende diagramme verteenwoordig die oog.

Diagram A

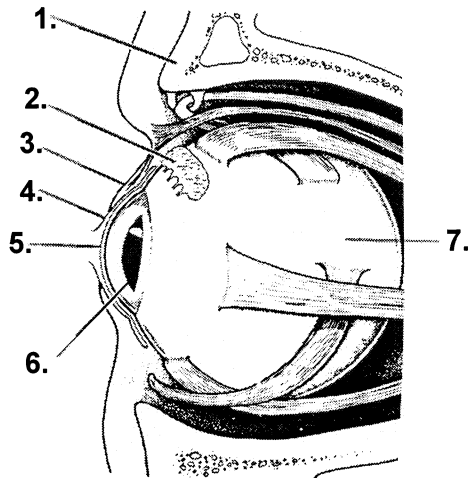


Diagram B

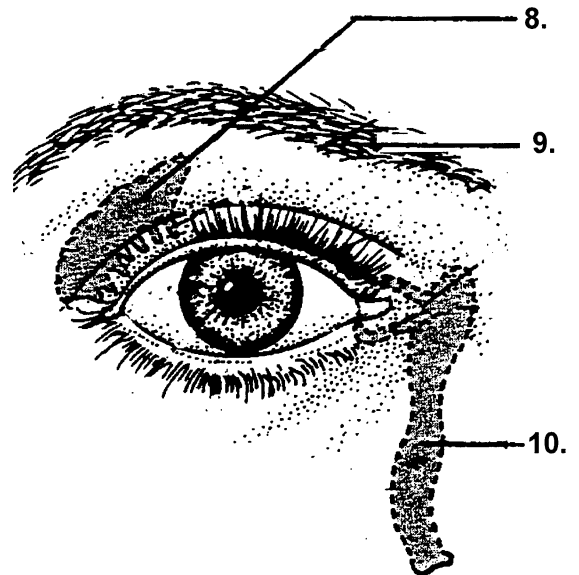


Fig. 6.1: Diagram van die menslike oog

- 6.1.1 Skryf die nommers van vier strukture in die bostaande diagramme neer wat 'n rol speel om die oog te beskerm teen meganiese beserings. (4)
 6.1.2 Skryf die nommer en die naam van die struktuur neer wat pynreseptore bevat. (2)
 6.1.3 Bespreek die proses wat by nommer 6 plaasvind, indien 'n persoon na 'n skerp lig kyk. (7)
 6.1.4 Identifiseer nommer 7 en bespreek sy bou en funksies. (7)
 6.1.5 Noem vier tipes vloeistowwe in die oog en bespreek twee funksies van elk. (12)
 6.1.6 Wat is die funksie van nommer 10 in diagram B? (2)

b.o.

- 5.1.4 (a) What is represented by no.6? (1)
 (b) Name the TWO types of organs that fulfil the function of no.6. (2)

5.2 Discuss the autonomic nervous system by referring to the following:

- 5.2.1 The THREE effectors that are regulated by the autonomic nervous system (3)
 5.2.2 The parts of the central nervous system that regulate the autonomic nervous system (2)
 5.2.3 The TWO subsystems of the autonomic nervous system and how they function (7)

[40]

QUESTION 6

6.1 The following diagrams represent the eye.

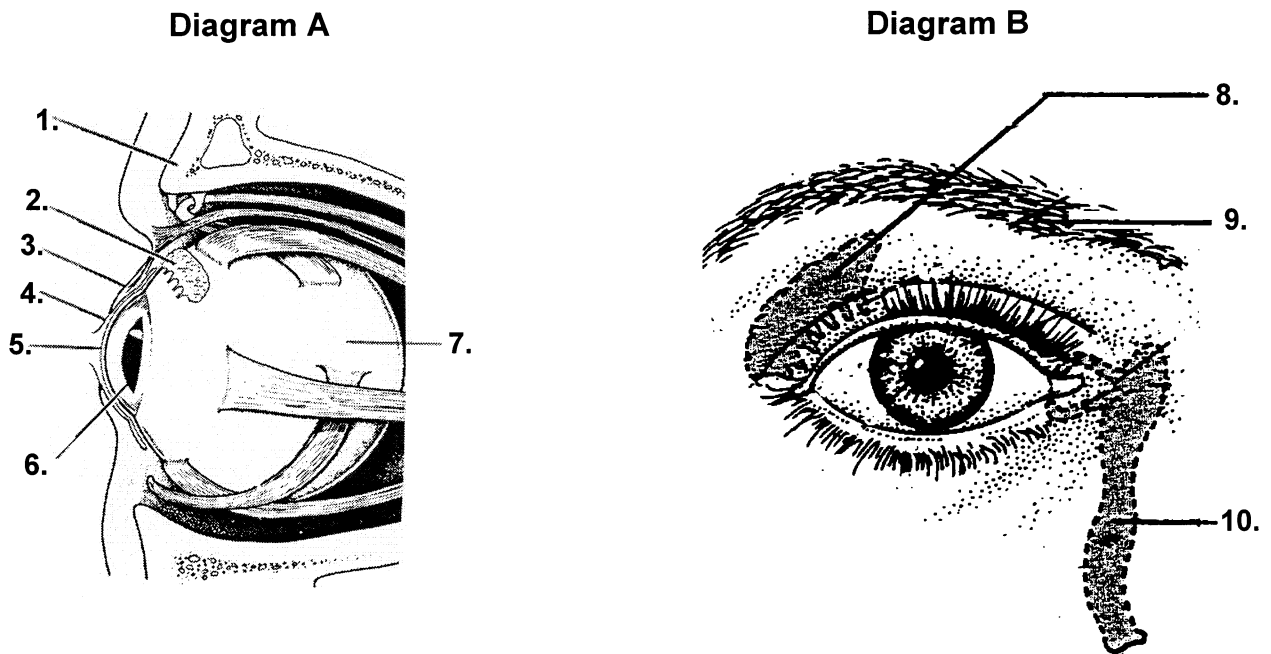


Fig. 6.1: Diagrams of the human eye

- 6.1.1 Write down the numbers given in the diagrams of four structures that protect the eye against mechanical injuries. (4)
 6.1.2 Write down the number and name of the structure that has pain receptors. (2)
 6.1.3 Discuss the process that takes place at number 6 when one is looking at a bright light. (7)
 6.1.4 Identify number 7 and discuss its structure and functions. (7)
 6.1.5 Name the four types of fluid present in the eye and discuss two functions of each. (12)
 6.1.6 What is the function of number 10 in diagram B? (2)

6.2 Maak 'n netjiese benoemde diagram van die buite- en middeloor van die mens.

(6)
[40]

VRAAG 7

7.1 Die volgende diagramme verteenwoordig die nier.

Diagram A

Verskillende bloedvate in die nier

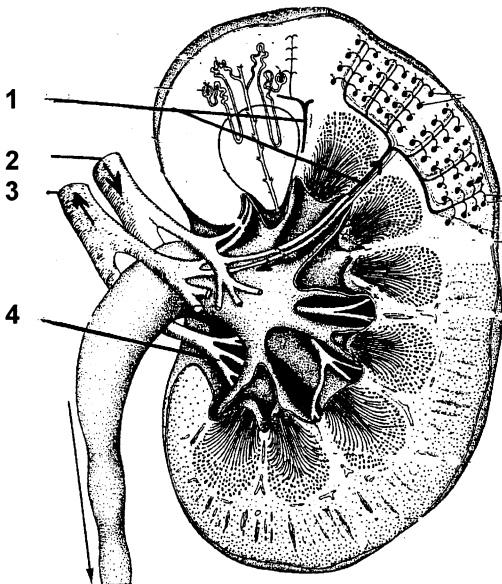
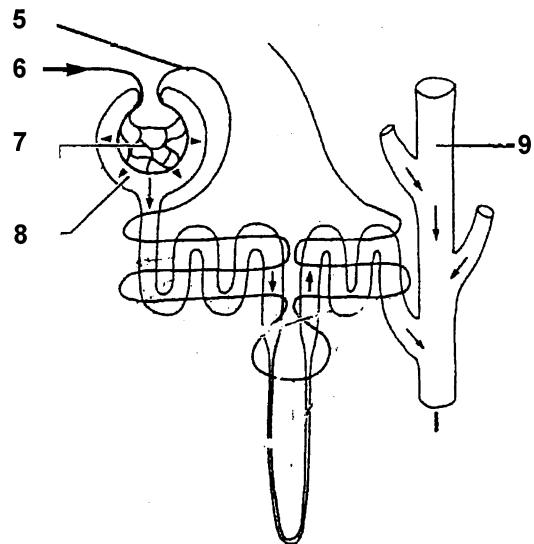


Diagram B

Die niernefron



7.1.1 Benoem die bloedvate in Diagram A en B wat 1 tot 7 genommer is.

(7)

7.1.2 (a) Wat word die vloeistowwe in strukture 8 en 9 onderskeidelik genoem?

(2)

(b) Ammonium vorm deel van die inhoud in no.9, maar is **nie** aanwesig in no.8 nie. Bespreek die prosesse waardeur ammonium gevorm word.

(10)

7.1.3 Noem VYF stowwe wat in no.9 aanwesig is, maar of ontbreek of in lae konsentrasies, in bloedvat no. 3 aanwesig is.

(5)

6.2 Draw a neat, labelled diagram of the outer and the middle ear of a person.

(6)
[40]

QUESTION 7

7.1 The following diagrams represent the kidney.

Diagram A

Different blood vessels of the kidney

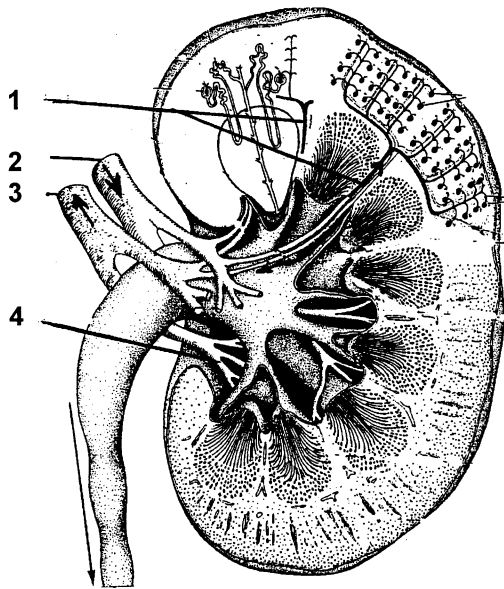
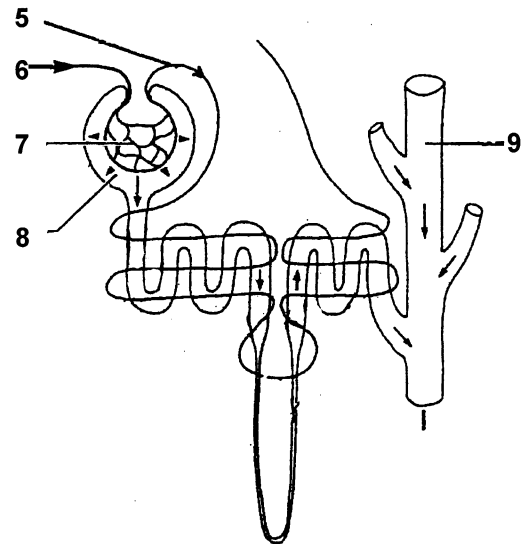


Diagram B

The nephron of the kidney



7.1.1 Name the blood vessels in Diagram A and B numbered 1 to 7.

(7)

7.1.2 (a) What are the liquids in structures 8 and 9 respectively called?

(2)

(b) Ammonium forms part of the contents in no.9 but **not** in no.8. Describe the process whereby ammonium is formed.

(10)

7.1.3 Name FIVE substances that are present in no.9 but are either absent or present in low concentrations in blood vessel no.3.

(5)

7.2 Die onderstaande diagramme stel 'n eksokriene en 'n endokriene klier voor.

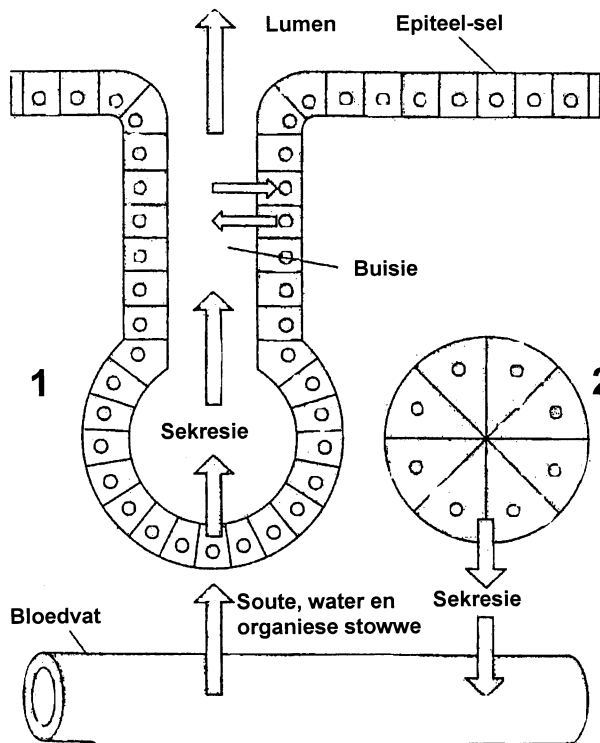


DIAGRAM A

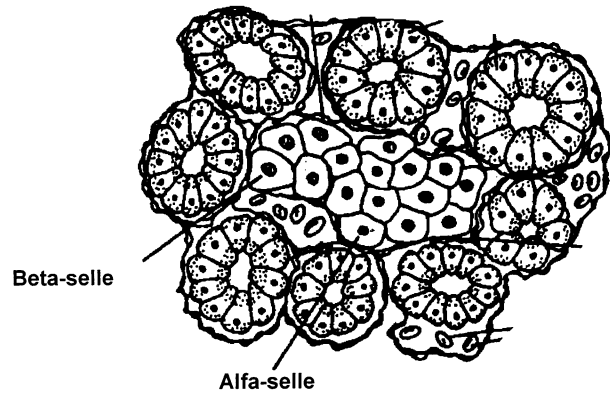


DIAGRAM B

7.2.1 Verklaar die terme **eksokrien** en **endokrien** deur na die funksie van die pankreas by onderskeidelik nommer 1 en 2 in Diagram A te verwys. (7)

7.2.2 Bespreek die rol van die alfaselle in Diagram B by die proses van glikogenolise (afbreek van glikogeen). (6)

7.2.3 Noem DRIE kenmerke van hormone. (3)

[40]

7.2 The diagrams below represent an exocrine and an endocrine gland.

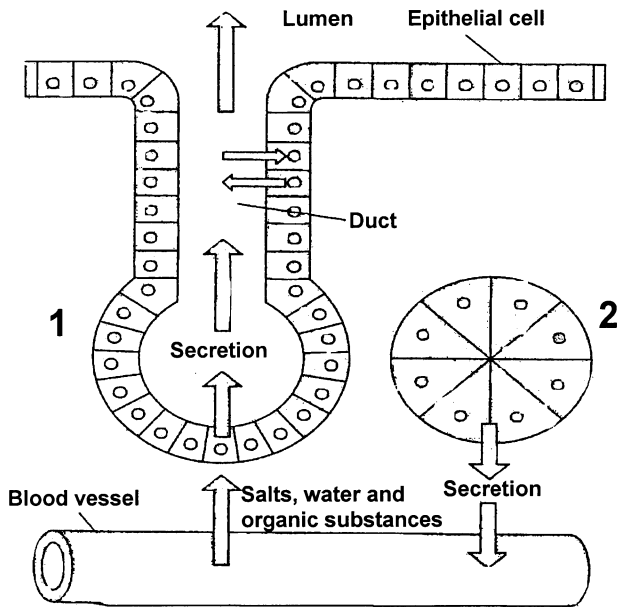


DIAGRAM A

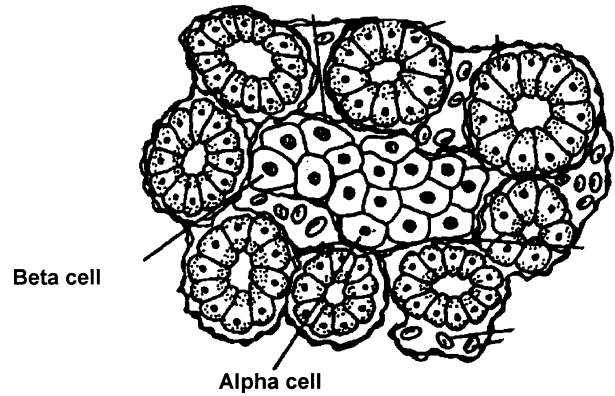


DIAGRAM B

- 7.2.1 Explain the terms **exocrine** and **endocrine** by referring to the function of the pancreas at numbers **1** and **2** respectively in Diagram A. (7)
- 7.2.2 Discuss the role of the alpha cells in Diagram B in the process of glycogenolysis (breakdown of glycogen). (6)
- 7.2.3 State **THREE** characteristics of hormones. (3)

[40]

VRAAG 8

- 8.1 Die getal ova in elke ovarium is reeds by geboorte bepaal. 'n Dogter word dus met 'n bepaalde getal oögoniums in haar ovaria gebore. Gee 'n skematiese voorstelling van oögenese vanaf die tyd wat 'n dogter puberteit bereik totdat ovulasie plaasvind. (11)
- 8.2 Maak 'n benoemde skets van die ovum net voor bevrugting. (5)
- 8.3. Bestudeer die diagram van die vroulike voortplantingstelsel en beantwoord die vrae wat volg.

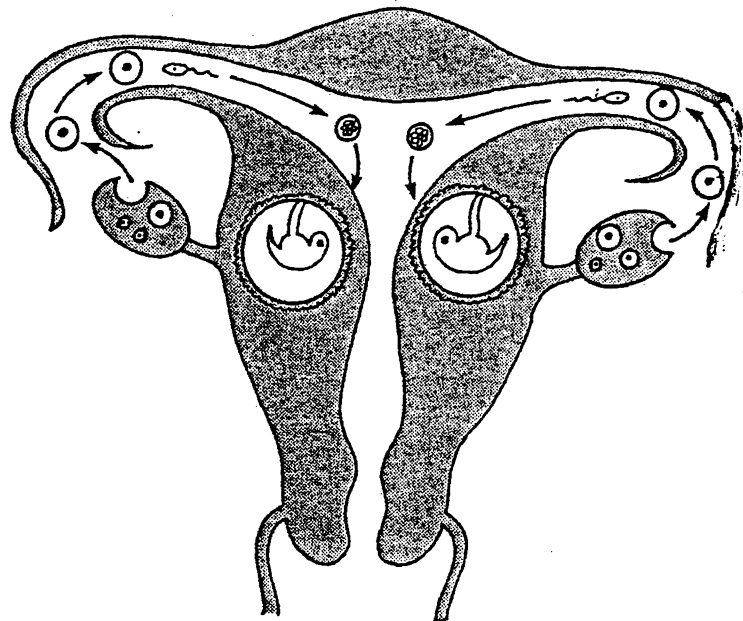


Fig. 8.3: Vroulike voortplantingstelsel

- 8.3.1 Bespreek veelvoudige swangerskappe soos van toepassing op die diagram. (5)
- 8.3.2 Bespreek die geboorteproses. (6)
- 8.3.3 Noem die hormone wat 'n rol speel tydens laktasie. (4)
- 8.4 "Voorgeboortesorg is van kardinale belang tydens swangerskap." Bespreek hierdie stelling deur te verwys na die volgende:
- 8.4.1 'n Gesonde dieet
- 8.4.2 Stowwe om te vermy (9)

[40]

TOTAAL VIR AFDELING B: [160]

QUESTION 8

- 8.1 The number of ova in every ovary is already determined at birth. Therefore a girl is born with a specific amount of oogonia in her ovaries. Give a schematic representation of the oogenesis process from the time a girl reaches puberty until ovulation. (11)
- 8.2 Draw a labelled sketch of an ovum just before fertilization. (5)
- 8.3. Study the diagram of the female reproductive system and answer the questions that follow.

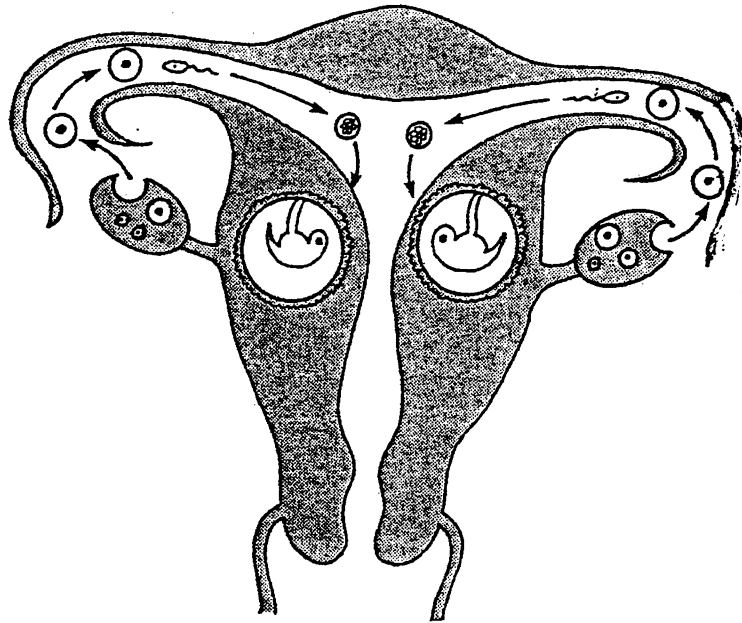


Fig. 8.3 The female reproductive system

- 8.3.1 Discuss multiple pregnancies with reference to the diagram. (5)
- 8.3.2 Discuss the process of birth. (6)
- 8.3.3 Name the hormones that play a role in lactation. (4)
- 8.4 "Antenatal care is very important during pregnancy." Discuss this statement by referring to the following:
- 8.4.1 Healthy diet.
- 8.4.2 Substances to be avoided (9)

[40]

TOTAL FOR SECTION B: [160]

AFDELING C

(2)

Beantwoord slegs EEN vraag uit hierdie afdeling (Vraag 9 of Vraag 10).

VRAAG 9

“Die hipofise dien as ’n chemiese koördineerder om homeostase in die liggaam te handhaaf.”

- 9.1 Waarom word daar ook na hierdie klier as “die meesterklier” verwys? (2)
- 9.2 Gee ’n ander naam vir die hipofise. (2)
- 9.3 Bespreek die hipofise deur te verwys na die volgende:
- 9.3.1 Posisie (4)
- 9.3.2 Anatomiese bou of struktuur (6)
- 9.3.3 Hipotalamiese beheer (13)
- 9.4 Tabuleer al die hormone van die anterior lob van die hipofise. Gee EEN funksie van elke hormoon. (16)
- bv.

Hormoon	Funksie
- 9.5 Hormonale sekresie deur die posterior lob, is weens ’n ongeluk gestaak. Watter effek sal dié toestand op die liggaam hê? (7)

[50]

SECTION C

Answer only ONE question from this section (Question 9 or Question 10).

QUESTION 9

“The hypophysis acts as the chemical co-ordinator to maintain homeostasis in the body”.

- 9.1 Why is this gland also referred to as the mastergland? (2)
- 9.2 Give another name for the hypophysis. (2)
- 9.3 Discuss the hypophysis by referring to the following
- 9.3.1 Position (4)
- 9.3.2 Anatomical structure (6)
- 9.3.3 Hypothalamic control (13)
- 9.4 Tabulate all the hormones of the anterior lobe of the hypophysis. Name ONE function of each hormone. (16)
- e.g.

Hormone	Function
---------	----------
- 9.5 Hormonal secretion by the posterior lobe stopped due to an accident. What effect does this have on the body? (7)

[50]

VRAAG 10

Bestudeer die onderstaande leesstuk en beantwoord die vrae wat volg.

“Alkohol is ’n dwelmmiddel en die effek op die liggaam is opmerklik. Alkohol is tans, naas hartkwale en kanker, een van die hooforsake van sterftes in ons land. Alkoholisme, die onbeheerbare, oormatige en langdurige inname van alkohol, lei tot liggaamlike, geestelike en sosiale probleme. Korsakov-sindroom is die gevolg van chroniese alkoholisme wat lei tot serebrale atrofie (inkrimping van die brein). So ’n persoon probeer sy swak geheue verberg met opgemaakte stories.

Die skade aan die sentrale senuweestelsel sluit ook in polineuritis (inflammasie van neurone) wat swakheid van liggaamspiere veroorsaak en gepaardgaan met struikelende loopgang en onvastigheid op die bene. Probleme ontstaan wanneer mense die uitwerking van alkohol op take wat koördinasie vereis (bv. motorbestuur), verontagsaam.

Alkohol veroorsaak die tipiese rooi gesig (gloede) deurdat dit die verwyding van kapillêre bloedvate (vasodilatasie) van die vel en selfs die afferente arteriool van die nefrone tot gevolg het. Alkohol funksioneer ook as diuretikum en verhoog urienafskeiding, wat selfs kan lei tot nierversaking. Wanneer ’n swanger vrou drink, drink die fetus saam en beïnvloed alkohol die fetus nadelig.”

Aangepas uit: J v Elfen, Dokter in die huis, 1993 1ste uitgawe”.

- 10.1 Noem DRIE hooforsake van sterftes in ons land vanuit die paragraaf. (3)
- 10.2 Definieer alkoholisme. (3)
- 10.3 Noem VIER simptome van die KORSAKOV-sindroom. (4)
- 10.4 Wat verstaan jy onder die term “**sindroom**”? (1)
- 10.5 10.5.1 Wat veroorsaak die tipiese rooi gesig van ’n alkoholis? (1)
- 10.5.2 Bespreek die effek van hierdie oorsaak genoem in 10.5.1 op liggaamstemperatuur. (8)
- 10.6 Die serebellum word geaffekteer deur die gebruik van alkohol.
- 10.6.1 Bespreek die normale funksies van die serebellum. (3)
- 10.6.2 Gee ’n ander term vir die gebrek aan spierkoördinasie wat ontstaan tydens beskadiging van die serebellum. (2)
- 10.7 Alkohol beweeg deur die plasenta.
- 10.7.1 Noem die dele waaruit die plasenta bestaan. (2)
- 10.7.2 Bespreek die funksies van die plasenta. (18)
- 10.8 Bespreek kortliks die werking van die hormoon wat alkohol se diuretiese effek sal teenstaan. (5)

[50]

TOTAAL VIR AFDELING C: [50]

TOTAAL: 300

EINDE

QUESTION 10

Study the passage below and answer the question that follows.

Alcohol is a drug and its effect on the body can be clearly seen. Alcohol is one of the main causes of death, besides heart disease and cancer in our country. Alcoholism, the uncontrollable, excessive and longterm intake of alcohol, is the reason for physical, mental and social problems. Korsakov syndrome is the result of chronic alcoholism and causes cerebral atrophy (shrinking of the brain). Such a person tries to hide his memory loss behind invented stories.

The damage to the central nervous system includes polyneuritis (inflammation of the neurons), which causes weakness of the muscles, together with a stumbling walk and unsteadiness. Problems occur when people ignore the influence of alcohol on tasks that require coordination (e.g. driving).

A typical red face is the result of vasodilation of the capillaries in the skin and afferent arterioles in the nephrons caused by alcohol. Alcohol also functions as a diuretic, therefore increasing the excretion of urine, which can lead to kidney failure. When a pregnant woman drinks her foetus drinks too and alcohol has a negative effect on the foetus.

Adapted from: J. v. Eifen, Dokter in die huis, 1993, 1st edition.

- 10.1 Name THREE main causes of death in our country from the paragraph. (3)
- 10.2 Define alcoholism. (3)
- 10.3 Name FOUR symptoms of KORSAKOV syndrome. (4)
- 10.4 What is meant with the term **syndrome**? (1)
- 10.5 10.5.1 What causes the typical red face of an alcoholic? (1)
- 10.5.2 Discuss the effect of this cause mentioned in 10.5.1 on body temperature. (8)
- 10.6 The cerebellum is affected by the intake of alcohol.
- 10.6.1 Discuss the normal functions of the cerebellum. (3)
- 10.6.2 Give the name for the lack in muscle coordination due to trauma to the cerebellum. (2)
- 10.7 Alcohol can diffuse through the placenta.
- 10.7.1 Name the parts that form the placenta. (2)
- 10.7.2 Discuss the functions of the placenta. (18)
- 10.8 Shortly discuss the functioning of the hormone that counteracts alcohol's diuretic effect. (5)

[50]

TOTAL FOR SECTION C: [50]

TOTAL: 300

END