



Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
Provinsie van die Oos Kaap: Departement van Onderwys
Porafensie Ya Kapa Botjhabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

KEREITI 12

LOETSE 2026

LIFE SCIENCES P1

MATSHWAO: 150

NAKO: Dihora tse 2½

Pampiri ena ya dipotso e na le maqephe a 16.

DITAELO LE THLAHISOLESERING

Bala ditaelo tse latelang ka hloko pele o araba dipotso.

1. Araba dipotso kaofela.
2. Ngola dikarabo KAOFELA BUKENG YA DIKARABO.
3. Qala Dikarabo tsa potso ka NNGWE leqepheng le LETJHA.
4. Nomora Dikarabo tsa hao jwale ka ha ho nomorilwe pampiring ya dipotso.
5. Araba dipotso ho ya ka ditaelo tsa potso ka nngwe.
6. Etsa didayakeramo KAOFELA ka pensele o di leibole ka pene e bolou kapa e ntsho.
7. Teroya didayakeramo, ditheibole kapa diflotjhate ha FEELA o laetswe.
8. Didayakeramo tse pampiring ena ya dipotso HA DI a etswa ho latela ditekanyetso.
9. O SE KE wa sebedisa pampiri ya kerafo.
10. O ka sebedisa khaltjhuleitha e sa porokeramuwang, protektara le khampase ha ho hlokeha
11. Dikhaltjhuleishene tsohle di lokela ho atametswa dibakeng tsa desimale tse PEDI.
12. Ngola ka mongolo o makgethe, o balehang

KAROLO YA A**POTSO YA 1**

1.1 Ho fanwe ka dikgetho tse ka nepahalang tse fapaneng e le dikarabo tsa dipotso tse latelang. Kgetha karabo e mme o ngole tlhaku (A–D) pela nomoro e nepahetseng feela (1.1.1 ho ya ho 1.1.9) BUKENG YA DIKARABO, mohlala 1.1.10 D.

1.1.1 Lefu le bakwang ke tlhokeho ya iodine.

- A Alzheimer's disease
- B Diabetes mellitus
- C Goitre
- D Multiple sclerosis

1.1.2 Bohato ba kgolo ya fertilised ovum moo ho etsahalang implantation.

- A Morula
- B Blastula
- C Foetus
- D Zygote

1.1.3 Lefu leo ho kobehang mahlasedi a kganya le bile le iponahatsa ka sebopeho se sa tlwaelehang sa cornea kapa lens, se tjhentjhang ho kena ha mahlasedi a kganya.

- A Short-sightedness
- B Cataracts
- C Long-sightedness
- D Astigmatism

1.1.4 Lethathamo la matshwao a body control system di fanwe ka tlase:

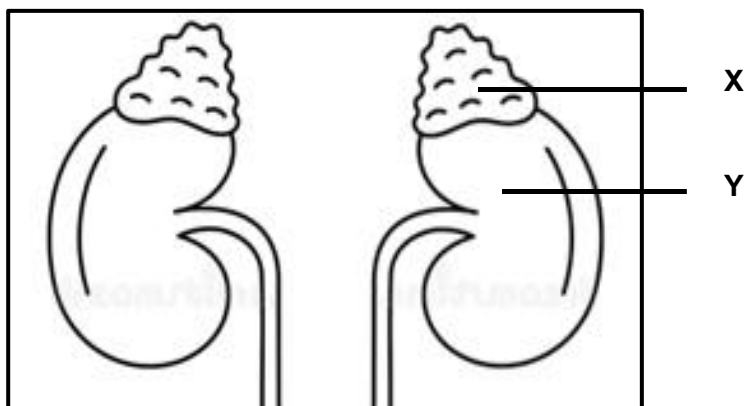
- (i) Reaction ho stimuli
- (ii) Production and the release of hormones
- (iii) Slow, long-lasting responses
- (iv) Involves the use of nerves

Ke matshwao afe a ikgethileng bakeng sa endocrine system?

- A (i) le (ii) feela
- B (i), (ii) le (iii) feela
- C (ii) le (iii) feela
- D (i), (ii), (iii) le (iv)

- 1.1.5 Ithute dayakeramo ya dikidney le digland tse amanang le tsona. Distrakhtjha **X** le **Y** di bontshitswe.

Ke ofe mola o theiboleng e ka tlase o bontshang ka ho NEPAHALA strakhtjha **X** le **Y**, ha mmoho le hormone tse amanang le tsona ka nngwe?



	X: Gland/Organ	X: Hormone	Y: Gland/Organ	Y: Hormone
A	Adrenal	Aldosterone	Kidney	Antidiuretic
B	Adrenal	Growth hormone	Kidney	Adrenaline
C	Kidney	Aldosterone	Adrenal	Antidiuretic
D	Kidney	Growth hormone	Adrenal	Adrenaline

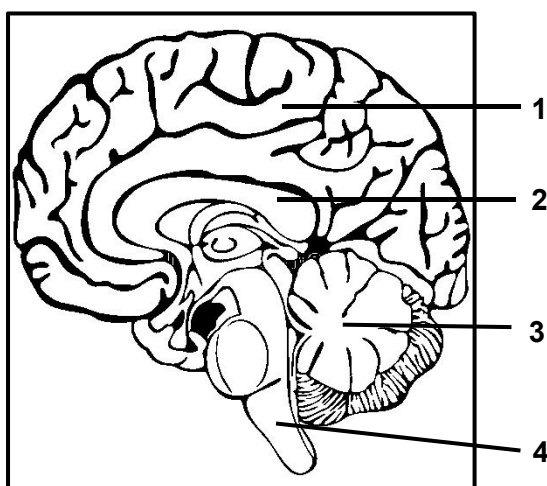
- 1.1.6 Ke efe ya dihormone tse lethathamong e tla nka karolo tshebetsong ya sympathetic nervous system?

- A Antidiuretic hormone
- B Aldosterone
- C Growth hormone
- D Adrenaline

- 1.1.7 Strakhtjha se sebetsang ho thibela le ho fokotsa kgonahalo ya tshwaetso ya HIV ho feta, e tloha ho mme e ya ho developing foetus

- A Amnion
- B Placenta
- C Umbilical Cord
- D Chorion

1.1.8 Cross section ya brain ya motho e fanwe ka tlase.



Ke efe e le NNGWE ya dikgetho e bontshang ka nepahalo mesebetsi ya dikarolo tse leibotsweng (1,2,3 le 4) tsa brain ya motho?

	1	2	3	4
A	Controls breathing	Regulates body temperature	Balance and posture	Heartbeat regulation
B	Controls involuntary actions	Neural interface between left and right hemispheres	Thinking and memory	Balance and posture
C	Controls voluntary actions	Connection between left and right hemispheres	Governs precise motor control	Life processes
D	Controls balance	Voluntary movement	Involuntary movement	Emotion and memory

1.1.9 Kamora ho ja dijo tse nang le dicarbohydrate tse ngata, insulin e thusa jwang ho boloka boemo ba tswekere mading bo le boemong bo tlwaelehileng?

- A Breaks down glycogen in the liver.
- B Stimulates the liver to convert glucose into glycogen
- C Increases glucagon secretion
- D Converts glucose into glycogen

(9 x 2) (18)

1.2 Fana ka **lentswe** ka **leng** le nepahetseng la bioloji (biological term) la thaloso ya tse latelang. Ngola lentswe feela pela nomoro ya potso (1.2.1 ho ya ho 1.2.8) BUKENG YA DIKARABO.

1.2.1 E etsa tjubule e ntshetsang moroto le semen kante mmeleng wa monna

1.2.2 Tulo e nyenyane ka tjebahalo le ka mosebetsi ho nervous system.

1.2.3 Lebitso le akaretsang digland tse nkang karolo ho etsa semen

1.2.4 Hormone e susumetsang kgolo ya matswele le ho ntsha lebese

1.2.5 Cell e kgethehileng, nerve ending, kapa protein molecule that detects specific stimuli

1.2.6 Prosese e laolang bongata ba kganya e kenang leihlong.

1.2.7 Plant stress hormone e etsang stomatal pores di kwalehe ha sejalo se tobane le tahlehelo ya metsi a mangata.

1.2.8 Homeostatic prosese e kgahlanong le ho tjhentjha ho tloha setlwaeding.

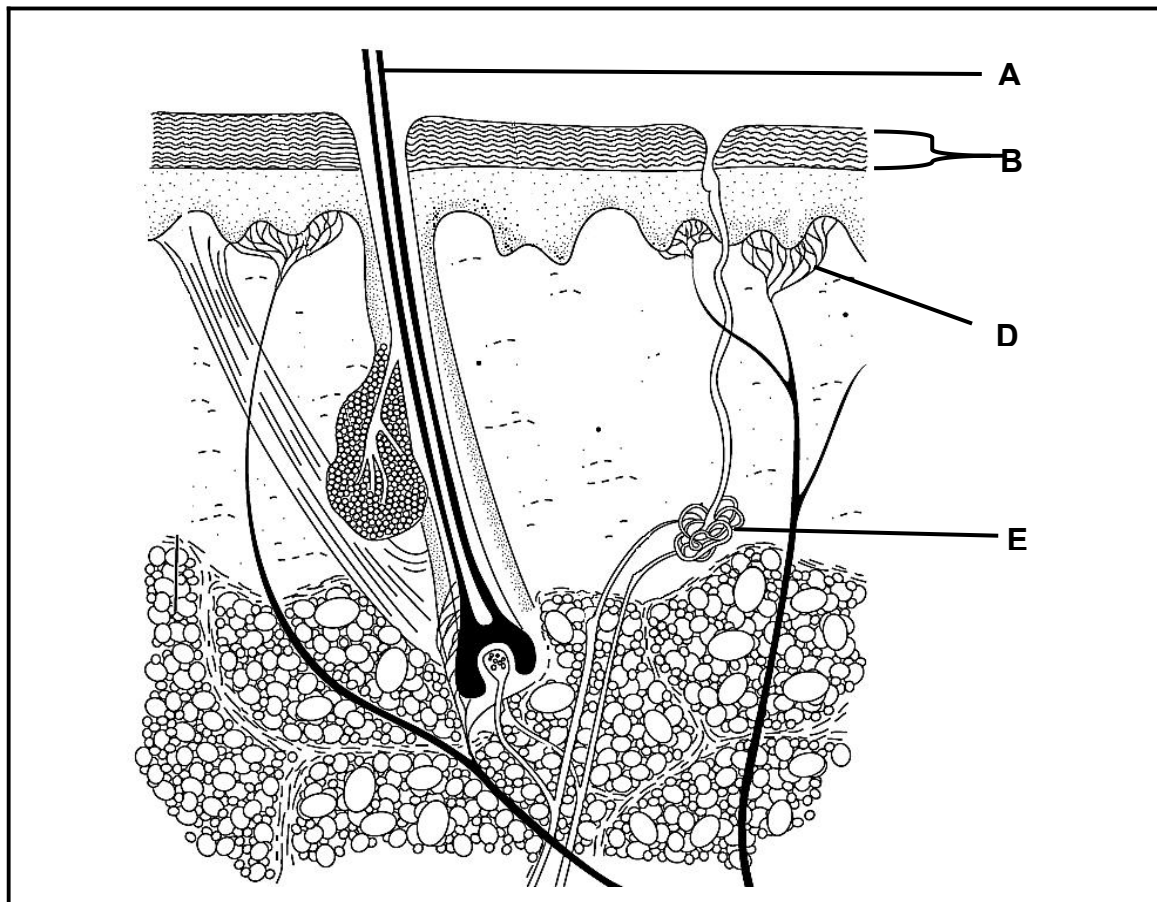
(8 x 1) (8)

1.3 Bontsha hore e nngwe ya ditlhaloso tse KHOLOMONG YA 1, di dumellana le A **FEELA**, B **FEELA**, A le B, kapa **HA E YO** ho dintho tse KHOLOMONG YA II. Ngola **A feela**, **B feela**, **A le B**, kapa **HA E YO**, dinomoro tsa dipotso (1.3.1 ho ya ho 1.3.3) BUKENG YA DIKARABO.

KHOLOMO I		KHOLOMO II	
1.3.1	Dieffector tse sebediswang taolong ya boemo bo hodimo ba CO ₂ mading	A:	Pancreas
		B:	Diaphragm
1.3.2	Mosebetsi /mesebetsi ya epididymis	A:	E boloka spermatozoa
		B:	Maturation ya spermatozoa
1.3.3	Hormone e nyollang glucose metabolism ka sekgahla	A:	Glucagon
		B:	Thyroxin
1.3.4	Qalong ya puberty, diketsahalo tse latelang di qadisa ho etsahala mosading.	A:	Gametogenesis
		B:	Narrowing of hips

(4 x 2) (8)

1.4 Dayakeramo e latelang e bontsha cross section ya letlalo la motho.



1.4.1 Hlalosa lebitso *thermoregulation*. (2)

1.4.2 Fana ka dileibole tsa dikarolo tse latelang:

(a) **A** (1)

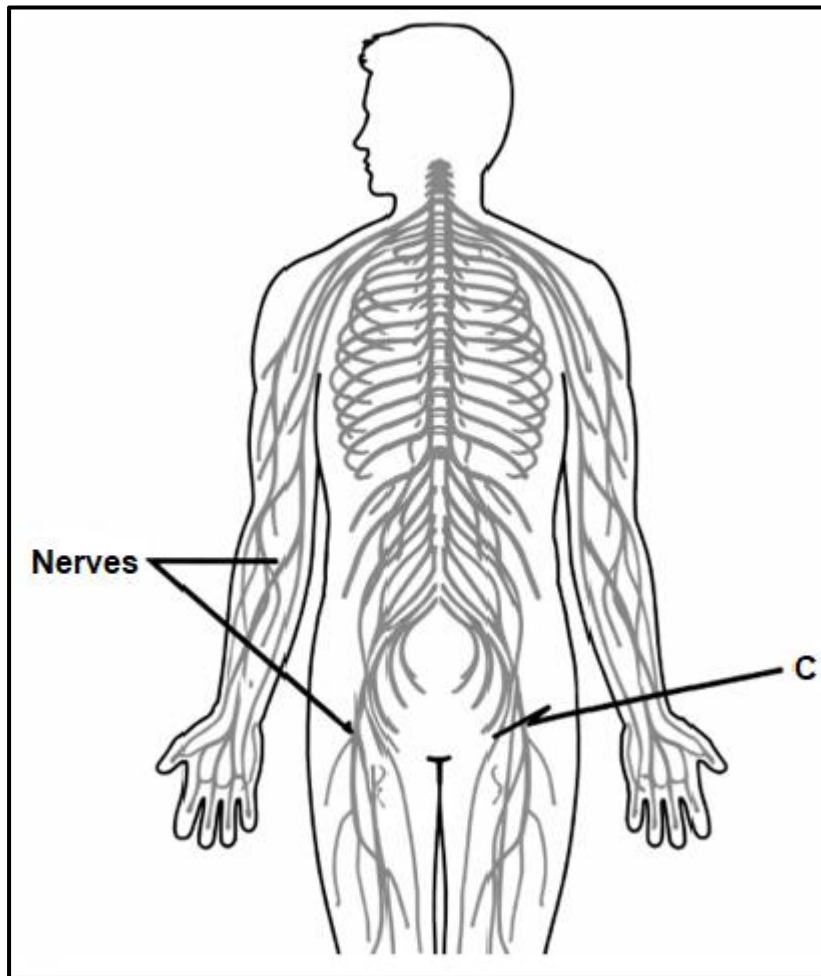
(b) **D** (1)

1.4.3 Fana ka matshwao a MABEDI a bonahalang ho dayakeramo a bontshang hore ke letsatsi le batang. (2)

1.4.4 Fana ka karolo ya brain e laolang thermoregulation. (1)

1.4.5 Latelanya dintlha tse PEDI tsa dinegative effect ha mmele o sa kgone ho thibela tahlehelo ya motjheso. (2)

1.5 Dayakeramo e ka tlase e emetse nervous system ya motho.



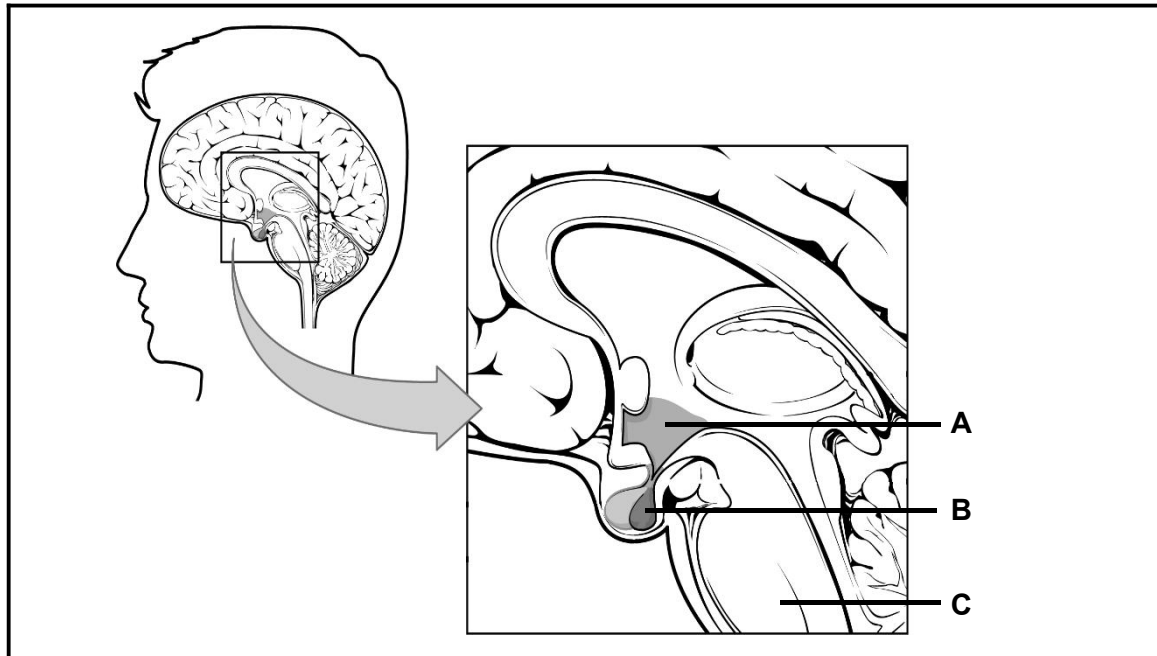
- 1.5.1 Dinerves tse ka hodimo ke tsa nervous system efe? (1)
- 1.5.2 Bolela mesebetsi e mmedi ya bohlokwa ya nervous system e boletsweng ho POTSO 1.5.1. (2)
- 1.5.3 Bolela:
- (a) dinerves tse isang le ho tlosa diimpulse ho spinal cord. (1)
 - (b) Straktjha seo dimotor neurons di tswang ho spinal cord (1)
- 1.5.4 Bolela ditlamorao tse PEDI mothong ha dimotor neurons di kgaohile ho C. (2)

[50]

MATSHWAO OHLE A KAROLO A: 50

KAROLO B**POTSO 2**

- 2.1 Dayakeramo e ka tlase e bontsha dikarolo tse fapaneng tsa dibopeho tse ka hara skull.



- 2.1.1 Hlwaya digland tse leibotsweng:

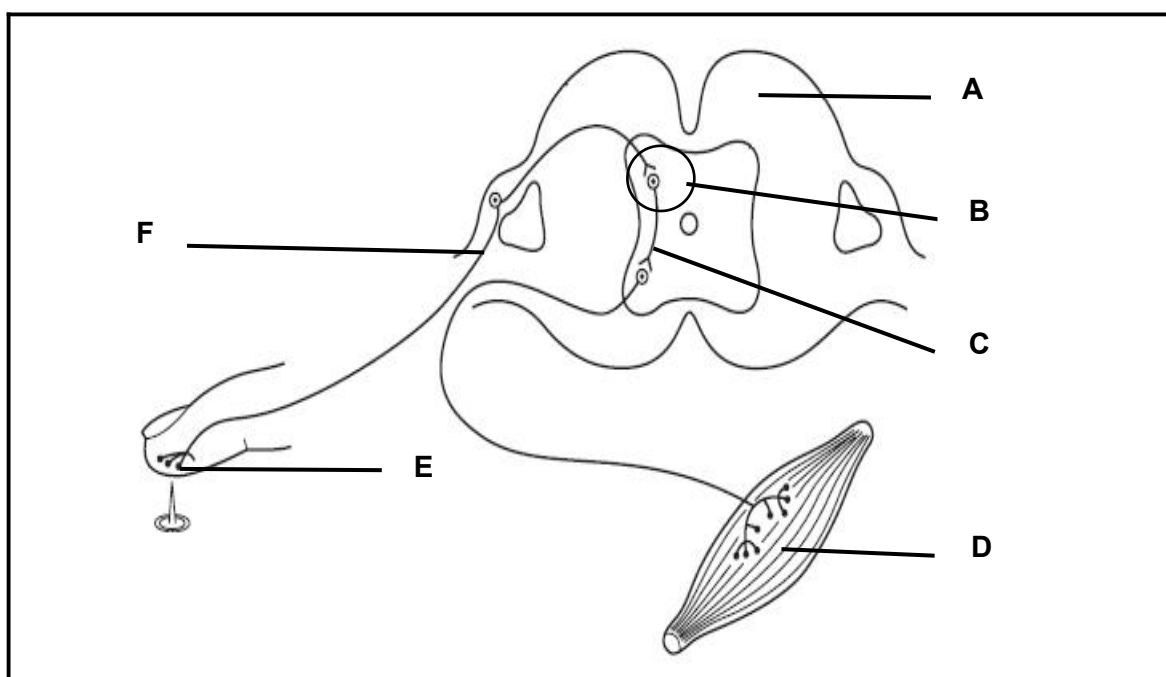
- (a) **A** (1)
- (b) **B** (1)

- 2.1.2 Lero le tswang ho gland **B** le nkuwa e le endocrine kapa exocrine? Fana ka mabaka a MABEDI a Karabo ya hao. (3)

- 2.1.3 Hlalosa mesebetsi e etswang ke **A** le **B** ha bohato ba metsi mading bo theohela ka tlasa boemo bo tlwaelehileng. (4)

- 2.1.4 Hlalosa mabaka a MABEDI ke hobaneng **C** nkuwa e le karolo e bohlokwa ya autonomic nervous system. (4)

2.2 Dayakeramo e ka tlase e bontsha karolo ya reflex arc.



2.2.1 Fana ka dileibole tse nepahetseng tsa dikarolo tse nepahetseng:

(a) **D** (1)

(b) **E** (1)

2.2.2 Hlalosa lentsewe *reflex action*. (2)

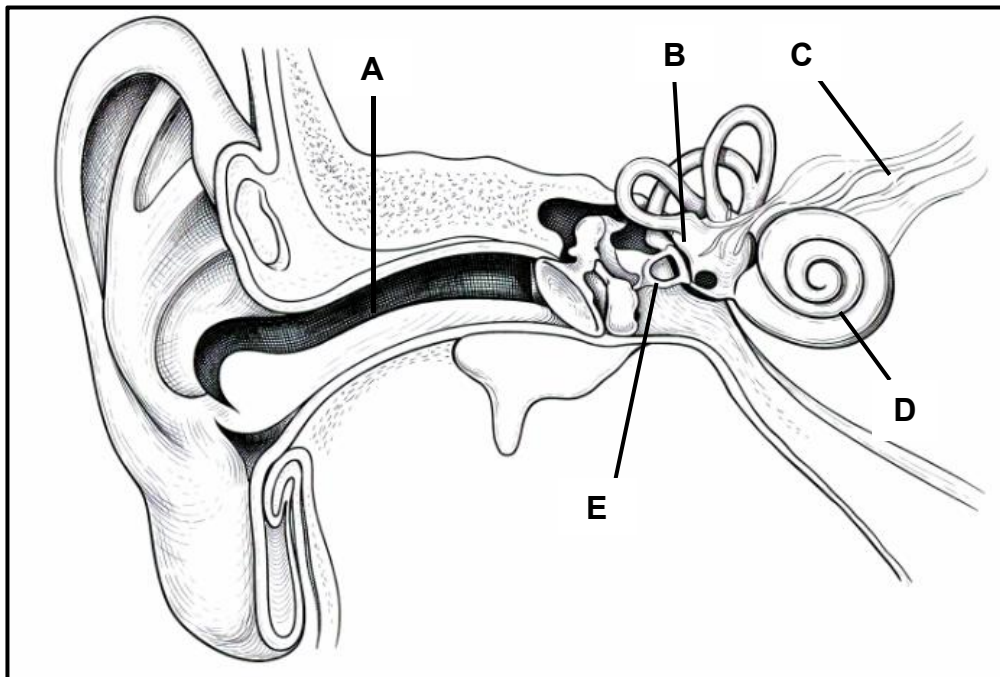
2.2.3 Etsa lethathamano la mesebetsi e MMEDI ya kopano **B** dipakeng tsa dineurons. (2)

2.2.4 Etsa theibole ya diphapano tse PEDI dipakeng tsa neuron **C** le neuron **F**. (5)

2.2.5 (a) Fana ka lebitso la tulo ya spinal cord leibotsweng **A**. (1)

(b) Hlalosa mosebetsi wa tulo ena ho tsamaiseng dinerve impulses. (2)

2.3 Dayakeramo e latelang e bontsha cross section ya tsebe ya motho.



2.3.1 Tsebahatsa karolo:

(a) **C** (1)

(b) **E** (1)

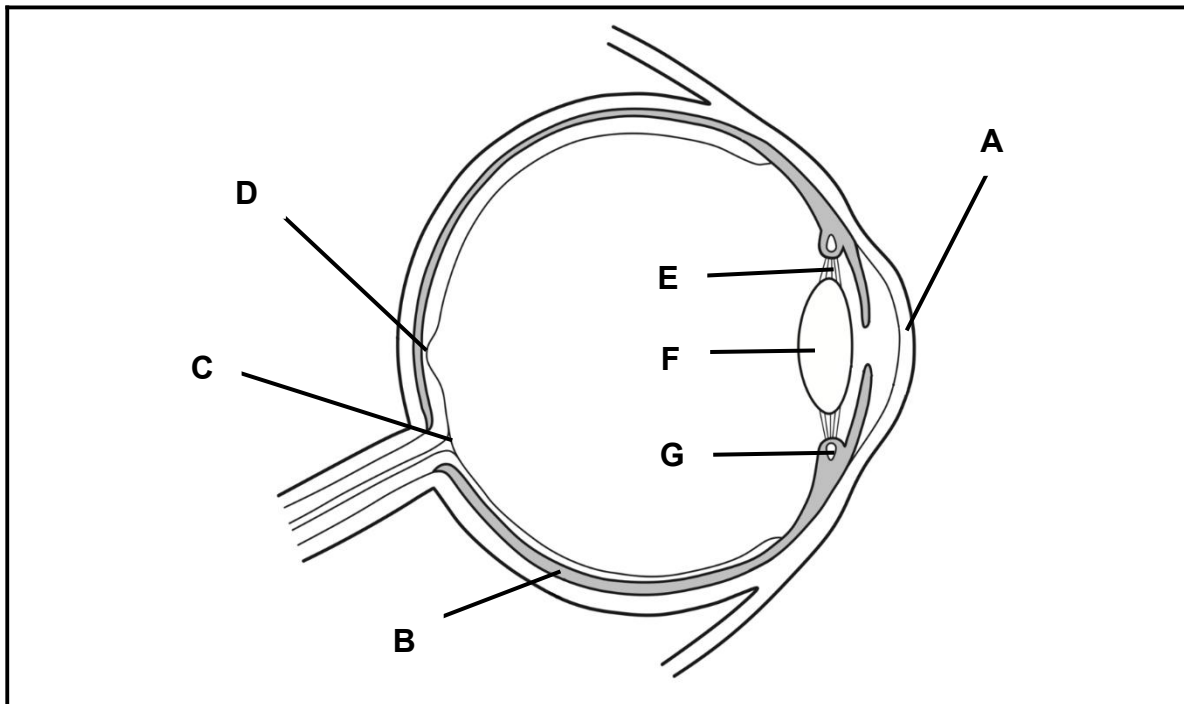
2.3.2 Bolela phapano pakeng tsa mefuta ya maqhubu a fumanehang ho dikarolo **A** le **D**. (2)

2.3.3 Tsebahatsa karolo e amehang ho static balance le ho hlalosa hore balance e kgutlisetsa jwang ha a sekamisitse hlooho kapa a tsamaya a sa e sekamisa. (4)

2.3.4 Motho o na le temalo ho cochlea.

Hlalosa hore temalo e ka ama jwang bokgoni ba kutlo mothong. (5)

2.4 Dayakeramo e latelang e bontsha cross section ya leihlo la motho.



2.4.1 Tsebahatsa karolo:

- (a) **A** (1)
- (b) **D** (1)

2.4.2 Hlalosa ka botlalo diphetoho tsa dibopeho **E**, **F** le **G** ha o shebile objekthe e bohole bo ka hodimo ho 6 m . (3)

2.4.3 Hlalosa lebaka le le LENG ke hobaneng karolo **C** e bitswa blind spot. (2)

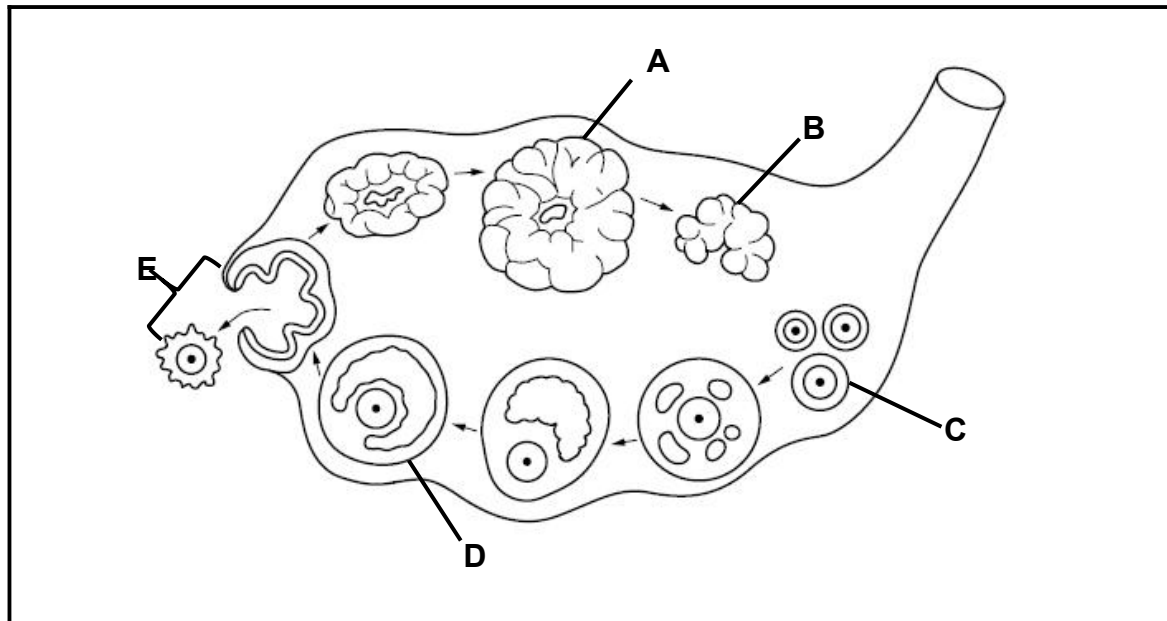
2.4.4 Ophthalmologist (eye specialist) O fumane mokudi a ena le bothata ba choroideremia, e leng boemo boo phallo ya madi ho ya leihlong bo fokotsehileng.

- (a) Tsebahatsa Tlhaku ya karolo ya leihlo e amehileng. (1)
- (b) Hlalosa ke hobaneng boemo bona bo etsa pono e be lerotho. (2)

[50]

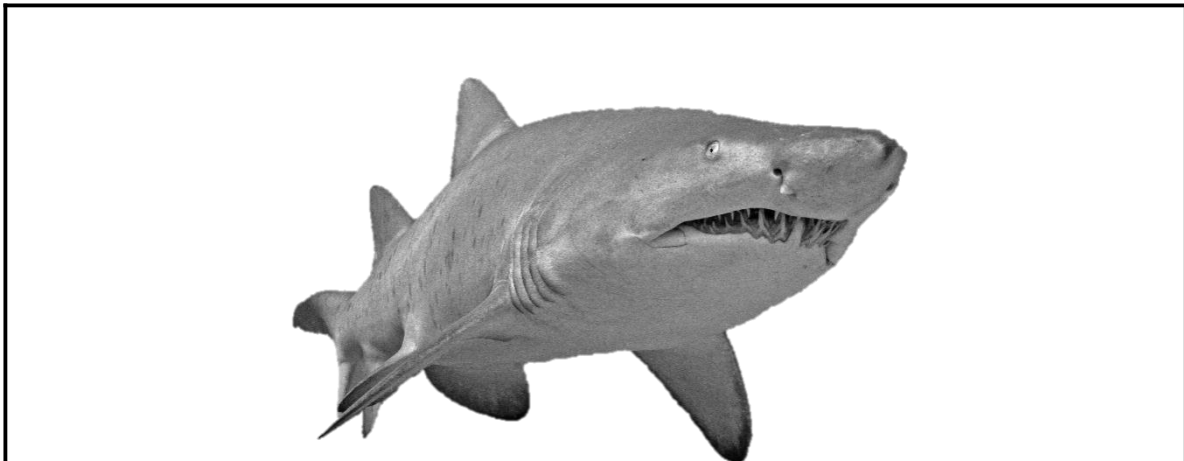
POTSO 3

3.1 Dayakeramo e ka tlase e bontsha cross section ya ovary.



- 3.1.1 Tsebahatsa straktjha **D**. (1)
- 3.1.2 Bolela porosese e etsahalang ho **E**. (1)
- 3.1.3 Hlalosa hore straktjha **C** se etswa jwang. (2)
- 3.1.4 Ha nako e ntse e tsamaya straktjha **A** se fetohela ho straktjha **B**.
 (a) Hlalosa sesosa sa phetoho ena. (1)
 (b) Hlalosa ditlamorao tsa phetoho ena ho menstrual cycle. (2)
- 3.1.5 Hlalosa mesebetsi e MMEDI ya di hormones tse ntshwang ke straktjha **A** le **D** ho beha menstrual cycle taolong. (4)
- 3.1.6 Polycystic ovarian disease e ka hloka oophorectomy (removal of the ovary) ha e se le boemong bo tshabehang.
 Haeba diovaries kabobedi di tloswa, hlalosa hore hona ho kaba le kgahlamelo e jwang ho menstrual cycle e tlwaelehileng. (4)

3.2 Bala qotso ya Tiger Shark (*Carcharias taurus*).



Carcharias taurus (commonly known as the ragged-tooth shark or sand tiger shark) e dula South African coastal waters. Hangata ho na le tse ngata tse tona ho feta tse tshehadi. Nakong ya ho tlolela (spring to early summer), tse ngata tse tona di ka etsa thobalano le e le nngwe e tshehadi. Tse tona di sebedisa dibopeho tse ikgethileng tse bitswang diclaspers ho fetisetsa sperm mmeleng wa e tshehadi. E tshehadi e na le uteri tse ngata moo dieggs di bang fertilised hape didevelopha. Qalong, diembryos disebedisa yolk bakeng sa nutrition. Hamorao, embryo e matlafetseng e ja dieggs tse ding le diembryos tse nyane (oophagy). Gestation e nka nako e ka bang dikgwedi tse 6-9. E tshehadi e tswala kamehla dilemong tse pedi e le nngwe ho ya ho tse pedi dipups (in one or two uterus). Dipups di tswalwa di ikemetse ebile di sa fumane tlhokomelo ya motswadi.

- 3.2.1 Tsebahatsa diadaptiveishene tse PEDI tsa *Carcharias taurus* tse eketsang menyetla ya internal fertilisation. (2)
- 3.2.2 Hlalosa ka botlalo developmental state sa *Carcharias taurus* ha e tswalwa. Fana ka lebaka la karabo ya hao. (2)
- 3.2.3 Hlalosa lentsewe *ovovivipary*. (2)
- 3.2.4 Hlalosa hore oophagy e nyolla jwang monyetla wa ho phela le tswa ya *Carcharias taurus*. (2)

3.3 Ithute phuputso ya saense e ka tlase.

NESTORONE LE TESTOSTERONE (NES/T) SKIN GEL E LE HORMONE YA SITHIBELA PELEHI SA MONNA

NES/T ke gel e tlotswang kamehla letlalong e kenelle mmeleng. Borasaense ba etsa diteko ka yona jwalo ka sethibela pelehi banneng. Ba batlile ho tseba phapano ya bongata ba Nestorone (NES), hammoho le testosterone (T) di ama jwang sperm prodakshene.

Experiment Design

- Banna ba baholo ba phetseng hantle ba 99, ba dilemong tse 18-50, ba sebedisitswe..
- Banna ba arotswe ka dihlopha tse tharo tse lekanang.
- **Sehlopha sa A:** se fumane testosterone gel e nang le placebo.
- **Sehlopha sa B:** se fumane gel e nang le testosterone le 8 mg Nestorone.
- **Sehlopha sa C:** se fumane gel e nang le testosterone le 12 mg Nestorone.
- Bankakarolo kaofela ba tlotsitse gel ha nngwe ka letsatsi kamora ho hlapa mantsiboya.
- Phuputso e nkile dibeke tse 24.
- Qalong sperm production se tlalehilwe e le 100% dihlopheng kaofela.
- Dibekeng tse 6, disemen sample dibokeletswe ho fumana percenteje ya ho theoha ha sperm production.

Diphetho

	Beke ya 6	Beke ya 12	Beke ya 18	Beke ya 24
Sehlopha sa A	18	21	24	26
Sehlopha sa B	61	74	82	89
Sehlopha sa C	62	71	80	88

Theibole e bontshang ho theoha ha sperm production

3.3.1 Tsebahatsa tse latelang ho tswa ho phuputso e fanweng:

- (a) Independente variebole (1)
- (b) Controlled (fixed) variebole e le NNGWE (1)
- (c) Dependent variebole e mejarishitswe jwang (1)

3.3.2 Bolela sepheo sa control sa phuputso ena (2)

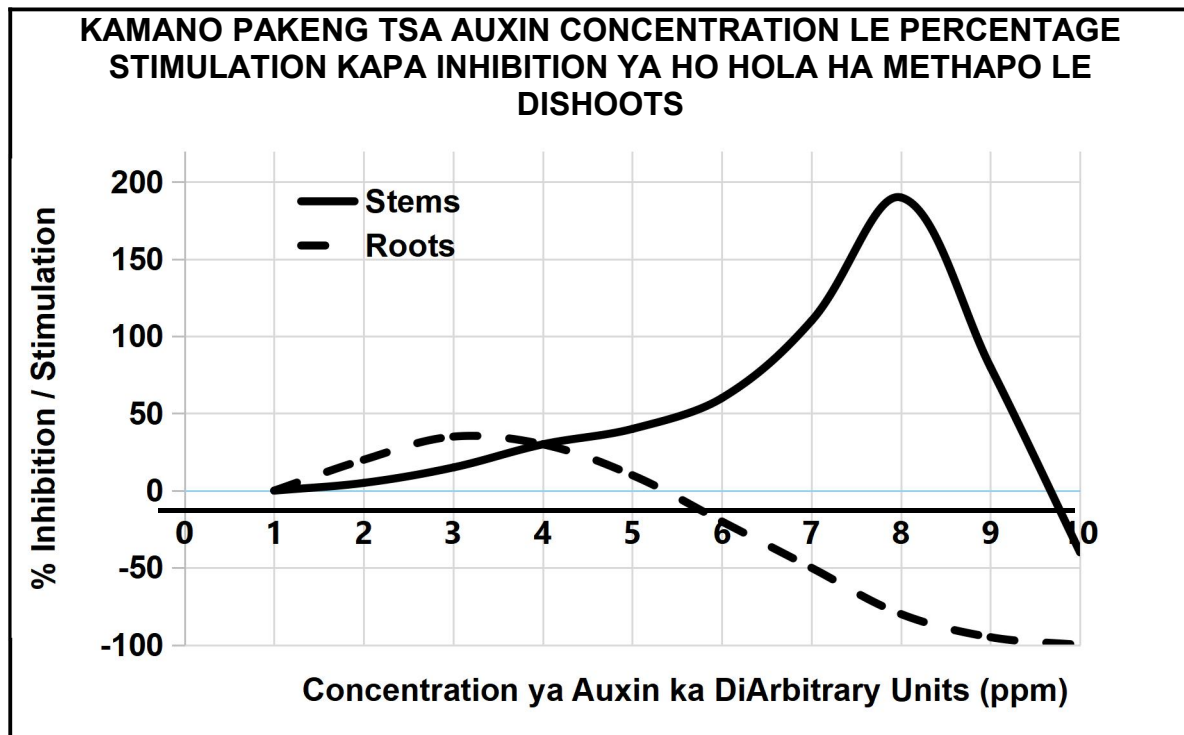
3.3.3 Hlalosa ka botlalo lebaka le le LENG hobaneng NES/T gel e kenyeletsa synthetic (artificial) testosterone. (2)

3.3.4 Teroya bar kerafo ho bontsha percenteje reduction ya sperm production sehlopheng sa **B** dibekeng tse 24. (6)

3.3.5 Banna ba bang ba na le qeyaqeyo tshebedisong ya NES/T e le sethibela pelehi. (2)

O sebedisa datha, fana ka lebaka le le LENG la sena. (2)

3.4 Ithute kerafo e ka tlase.



- 3.4.1 Hlalosa lentswe *tropism*. (2)
- 3.4.2 Stem sa sejalo se hlahisitswe ho unilateral light.
- (a) Sebedisa kerafo, ho tsebahatsa range ya auxin concentration (any 2 units) ka lehlakoreng le moriting la stem. (2)
- (b) Hlalosa ka botlalo hore stem se tla hola jwang. (2)
- 3.4.3 Bapisa hore methapo le dishoots di tla hola jwang ha auxin concentration e eketseha. (4)
- 3.4.4 Hlalosa hore auxin e ka sebediswa jwang ho laola lehola. (2)

[50]

MATSHWAO A KAROLO YA B: 100
MATSHWAO OHLE: 150