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# NATIONAL SENIOR CERTIFICATE

## IBANGA 12

### SEPTEMBER 2024

## LIFE SCIENCES P1

**AMANQAKU:** 150

**IXESHA:** 2½ iiyure

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Eli phepha lemibuzo linamaphepha ayi15.



**IMIYALELO NEENKCUKACHA**

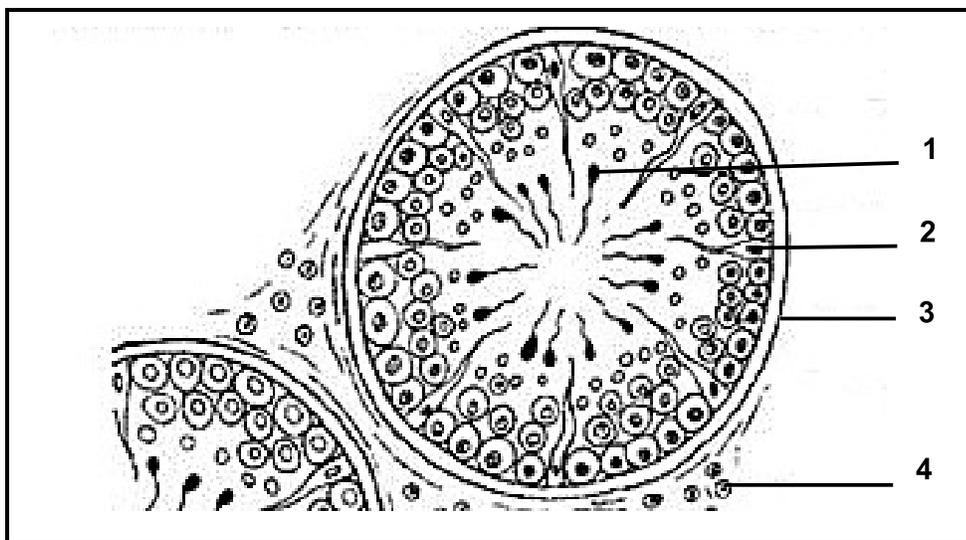
Funda imiyalelo elandelayo ngenkathalo phambi kokuphendula imibuzo.

1. Phendula YONKE imibuzo.
2. Bhala ZONKE iimpendulo kwiNCWADI YOKUPHENDULELA.
3. Qala mbuzo ngamNYE kwiphepha ELITSHA.
4. Nombola iimpendulo ngokuchanekileyo ngokwendlela esetyenzisiweyo kwiphepha lemibuzo.
5. Nika iimpendulo zakho ngokomyalelo wombuzo ngamnye.
6. YONKE imizobo mayenziwe ngepenisile ulebhelishe ngeinki eblowu okanye emnyama.
7. Zoba iidayagram, iitheyibhile okanye iiflowu tshati xa ucelwe wenze njalo kuphela.
8. Iidayagram kweli phepha AZIZOTYWANGA ngokwesikeyile.
9. UNGASEBENZISI phepha legrafu.
10. Sebenzisa ikhalithyuleyitha engaprogranywanga, iprothekththa nekhampasi, apho kuyimfuneko.
11. Zonke iikhalithyuleyishini mazisondezwe kwindawo EZIMBINI zedesimali.
12. Bhala ngokucocekileyo nangokucacileyo.

**ICANDELO A****UMBUZO 1**

1.1 Iindlela ezahlukileyo zinikiwe njengeempendulo ezinokuchaneka kwimibuzo elandelayo. Khetha impendulo echanekileyo uze ubhale unobumba kuphela (A–D) ecaleni kwenombolo yombuzo (1.1.1 ukuya ku1.1.9) kwiNCWADI YOKUPHENDULELA, umzekelo 1.1.10 D.

1.1.1 Funda idayagram engezantsi ebonisa ikhrosi sekshini yeeteste.



Iileyibhile ezichanekileyo zika1–4 kwidayagram engentla:

	1	2	3	4
A	Sperm	Sertoli cells	Seminiferous tubule	Leydig cells
B	Leydig cells	Sperm	Sertoli cell	Seminiferous tubule
C	Sperm	Leydig cells	Seminiferous tubule	Sertoli cells
D	Sertoli cells	Seminiferous tubule	Sperm	Leydig cells

1.1.2 Unobangela wokungakhutshwa kweinsulin egazini emva kwesidlo.

- A Yigoitre
- B Yidiabetes Type 1
- C Yidiabetes Type 2
- D Yihypoglycaemia

1.1.3 Qwalasela uludwe olungasezantsi.

- (i) Ipupil iyaconstricta.
- (ii) IIsuspensory ligament ziyatsaleka zibetaught.
- (iii) Ipupil iyadayaleyitha.
- (iv) Ukukhanya okuninzi kungena ngaphakathi kwimehlo.

Yeyiphi kumabinzana angentla echaza iprowusesi eyenzeka kwimehlo ukuze kwenzeke i-image endlwini enokukhanya okudim?

- A (ii) no (iii) kuphela
- B (i), (ii) no (iv)
- C (iii) no (iv)
- D (iii) kuphela

1.1.4 Umntu akeva ngenxa yeorgan of Corti eyonzakeleyo.

Yeyiphi kwiitreatment ezilandelayo enokuphucula ukuva komntu?

- A Cochlear implant
- B Grommet
- C Hearing aid
- D Ukususwa kwecochlea

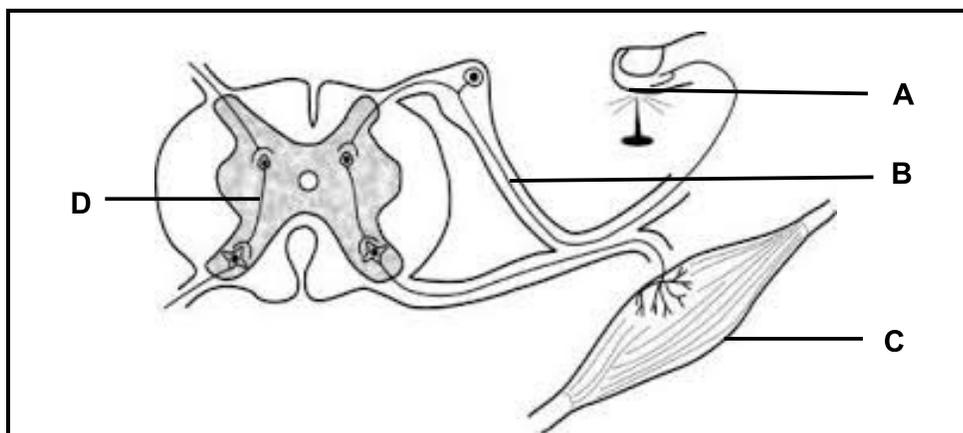
1.1.5 Yeyiphi eNYE kwiiplant hormone ezilandelayo esisibulalikhula esisebanzayo?

- A Gibberellin
- B Abscisic acid
- C Auxin
- D Ethylene

1.1.6 Yeyiphi eNYE kumabinzana alandelayo ebangelwa yireflex action?

- A Yenza ukuba icerebrum i-interpretate istimuli.
- B Yenza iresponse ekhawulezayo nezenzekelayo.
- C Ithintela umntu ekuveni intlungu.
- D Inika ixesha leinterpretation neco-ordinated response.

1.1.7 Idayagram engezantsi imele ireflex arc.



Ukuba indawo u**B** yonzakele ... asuse umnwe wakhe.

- A akuzuvakala ntlungu, nomntu akayikubanako ukutsala
- B iintlungu azizukuvakala, nomntu uyakubanako ukutsala
- C iintlungu zizakuvakala, nomntu akayikubanako ukutsala
- D akuzuvakala ntlungu, nomntu uyakubanako ukutsala

1.1.8 Qwalasela amabinzana angezantsi.

- (i) Less aldosterone will be secreted.
- (ii) More sodium ions will be reabsorbed into blood.
- (iii) More sodium ions will form part of the urine.
- (iv) Sodium ions will remain in the renal tubule.

Ukuba isodium concentration egazini iphezulu, zeziphi kumabinzana angentla a**NYANISILEYO**?

- A (i); (iii) no (iv)
- B (ii), (iii) no (iv)
- C (iii) no (iv) kuphela
- D (i) no (ii) kuphela

1.1.9 Iparasympathetic nervous system inegalelo ...

- A lokunyusa igazi eliya kwiskeletal muscle.
- B kwifight or flight response.
- C lokubuyisela ukubetha kwentliziyo kwisiqhelo.
- D kwiicranial nerve.

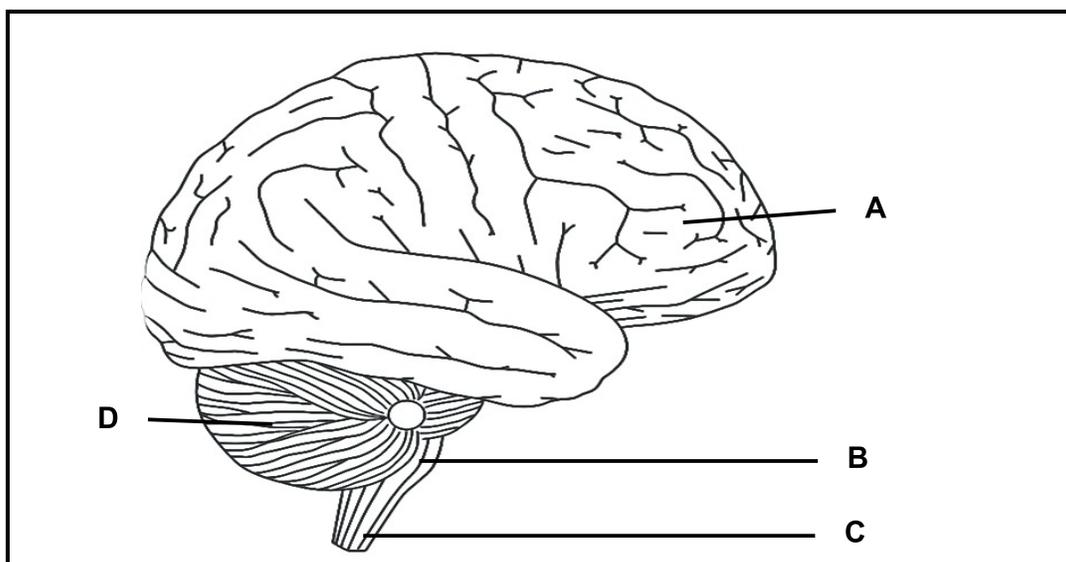
(9 x 2) (18)

- 1.2 Nika **ithem yebhayoloji** efanelekileyo endaweni yenkcazelo nganye kwezilandelayo. Bhala ithem kuphela ecaleni kwenombolo yemibuzo (1.2.1 ukuya ku 1.2.9) ENCWADINI YOKUPHENDULELA.
- 1.2.1 Yiyo eva istimulus iphinde igenerate i-impulse
- 1.2.2 Iextra-embryonic membrane evumela igaseous exchange kwiamniotic egg
- 1.2.3 Idlala okanye isihlunu esiresponda kwistimuli
- 1.2.4 Ukuvuleka komthambo wegazi ukulungiselela ukunyusa ukuhamba kwegazi
- 1.2.5 Uhlobo lwelens olufunekayo ukunceda ishort-sightedness
- 1.2.6 Idlala elifumaneka kwiimammal zodwa elikhupha ubisi phantsi kweempembelelo zeprolactin
- 1.2.7 Ileya kwimehlo eneephotoreceptor
- 1.2.8 Indawo ekufumaneka kuyo iosmoreceptor emzimbeni
- 1.2.9 Isithuba esincinci phakathi kweneuron esivumela ukuhamba kweimpulse ukusuka kwenye ukuya kwelandelayo
- (9 x 1) (9)
- 1.3 Bonisa ukuba iinkcazelo ezikuKHOLAM I zisebenza ku**A KUPHELA**, Ku**B KUPHELA**, ku**A noB** okanye **AKUKHO NANYE** kwiiyithem ezikuKHOLAM II. Bhala **A kuphela**, **B kuphela**, **A noB** okanye **AKUKHO NAYE** ecaleni kwenombolo yemibuzo (1.3.1 ukuya ku1.3.4) ENCWADINI YOKUPHENDULELA.

KHOLAMNI I		KHOLAMNI II	
1.3.1	Umsebenzi (imisebenzi) weplacenta	A:	Yimaintenance yepregnancy
		B:	Ikhuselelwa ifoetus kwimechanical injury
1.3.2	Umsebenzi weabscisic acid ezityalweni	A:	Ipromowutha iflowering
		B:	Yenza ukudevelopha kwengcambu
1.3.3	I/iihormone ezenza iosmoregulation	A:	Aldosterone
		B:	Anti-diuretic hormone
1.3.4	Ukuphulukana nememori ngenxa yokudijenereyitha kweneerve tissue.	A:	Alzheimer's disease
		B:	Multiple sclerosis

(4 x 2) (8)

1.4 Idayagram engezantsi ibonisa indawo ye central nervous system.



1.4.1 Xela UNOBUMBA neGAMA leyona ndawo ichaphazelekileyo xa umntu enezi mpawu zilandelayo emva kwengozi:

- (a) Ukungakwazi kubhala ngokwesiqhelo. (2)
- (b) Ukuchaphazeleka kokuthetha. (2)
- (c) Ukuphazamiseka kokuphefumla nokebetha kwentliziyo. (2)

1.4.2 Cacisa ngokuzathuza iindlela eziMBINI zokukhusela indawo uC ekonzakaleni. (4)

1.5 Zoba uleyibhelishe idayagram ye sensory neuron. (5)

**[50]**

**EWONKE AMANQAKU ECANDELO A: 50**

## ICANDELO B

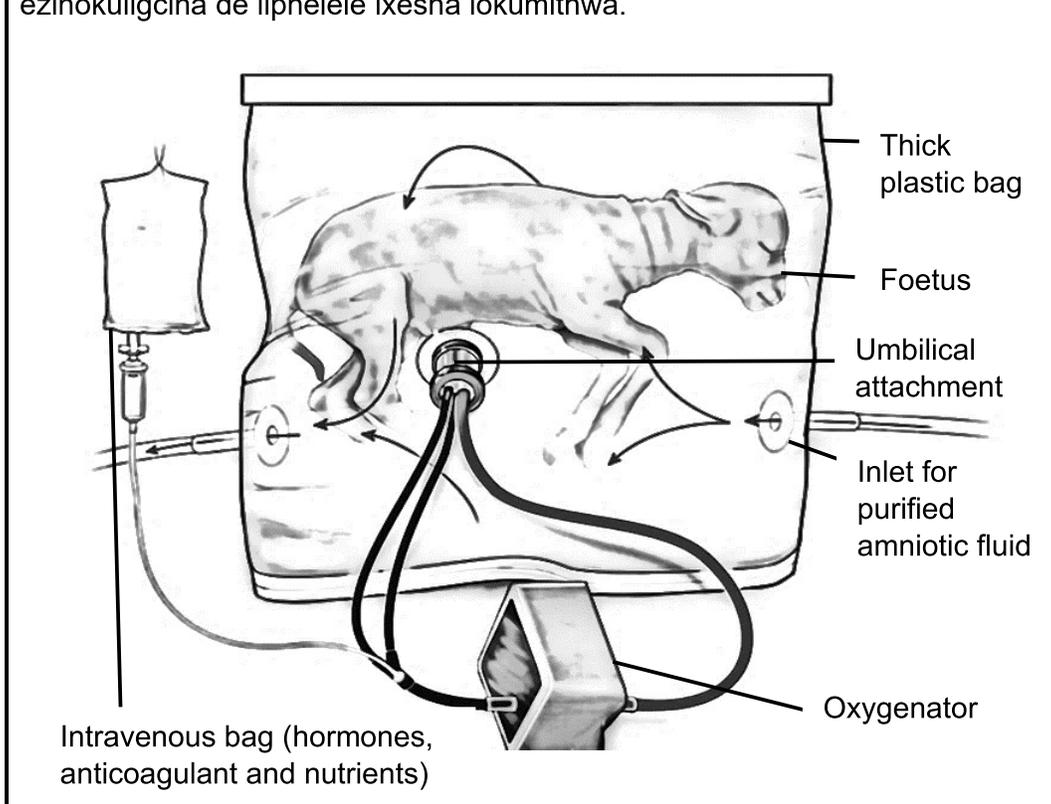
## UMBUZO 2

2.1 Funda isicatshulwa esingezantsi.

EMzantsi Afrika, ukuzala abantwana phambi kwexesha kwenzeka kayi84 000 unyaka nonyaka. Abantwana abazelwe phambi kwexesha ngabo bazalwa bephila phambi kokuphela kweeveki ezima40 zokumitha okupheleleyo.

110% yaba bantwana bazelweyo isemngcephekweni wokufa okanye ibeneengxaki zequbuliso zokuphefumla, ezeeneuron nezamehlo xa ubathelekisa nabazelwe begqibile ukukhula kuba bona abakhulanga ngokupheleleyo.

I 'biobag' kwidayagram engezantsi, ibonisa isibekeko esenziweyo apho umntwana aqhubeka nokukhula. Izifundo zibonise ukuba le 'biobag' ingasetyenziswa ekwenzeni ukuba itakane libekuzo zonke iimeko ezinokuligcina de liphelele ixesha lokumithwa.



2.1.1 Khalityhuleyitha inani labantwana abazelwe phambi kwexesha eMzantsi Afrika abasemngcephekweni wokufa okanye abaneengxaki zokuphefumla, ezeeneuron nezamehlo eziqubulisileyo. (3)

2.1.2 Xela indawo ibeNYE ye'biobag' wandule ukucacisa ngokuzathuza ukuba ifana njani ngokusebenza ne:

(a) Amnion (2)

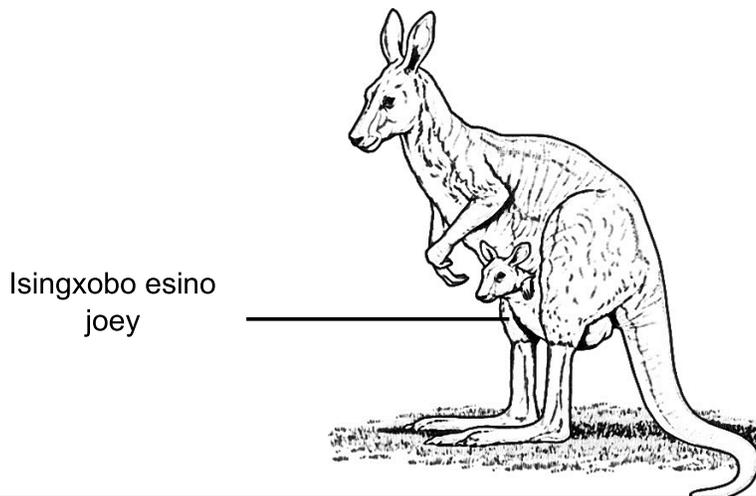
(b) Placenta (2)

2.1.3 Chaza ukuba i 'biobag' ingakunqanda njani ukungakhuli ngokugqibeleleyo kwamalungu omzimba kubantwana abazelwe phambi kwexesha. (3)

2.1.4 Dwelisa zibeMBINI iindlela zolwamkeleko ngokwasekuhlaleni emaziqwalaselwe phambi kokusetyenziswa kwereproductive technology ebantwini. (2)

2.2 Funda isicatshulwa esingezantsi.

Ired kangaroo yeyona inkulu kuzo zonke iikangaroo species kwaye iendemic eAustralia. Ngexesha lecopulation inkunzi ithululela isemen emzimbeni wethokazi ze limithe iintsuku ezima33 phambi kokuba lizale. Ithole lekangaroo elingaboniyo, elize nelimilenze ingomelelanga liyakhasa ligudla uboya bukamama walo liyekungena kwisingxobo (pouch) sikamama apho lifika lithi nca kwingono elincanca kuyo lihlale likhuselekile iintsuku ezima190 ezilandelayo de libengu joey owomeleleyo. Kwiintsuku ezingama235 ujoey ukulungele ukuphuma kwisingxobo sikamama wakhe angaphinde abuyele.



2.2.1 Xela uhlobo lwefertilisation olwenzeka kwired kangaroo. (1)

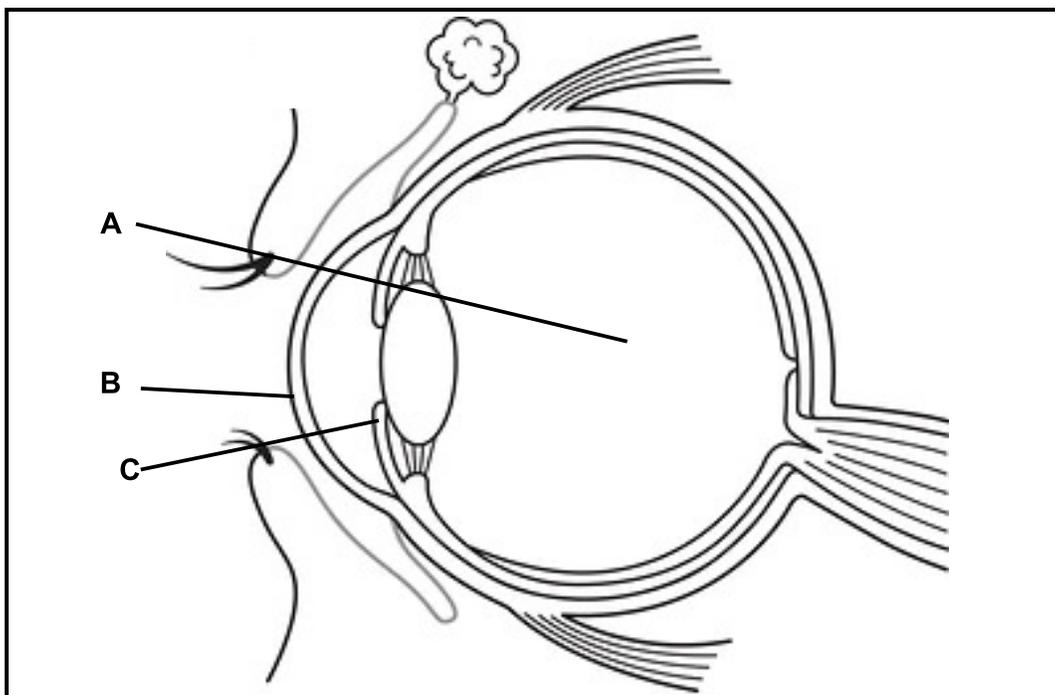
2.2.2 Nika sibesiNYE isizathu sempendulo yakho ekuMBUZO 2.2.1. (1)

2.2.3 Xela ireproductive strategy esetyenziswa zired kangaroo apho azalwa ephila amathole. (1)

2.2.4 Tyatyadula ubhale ngeparental strategy ibeNYE eboniswa yired kangaroo ekuqinisekiseni ngolona khuseleko lwemathole layo. (2)

2.2.5 Kutheni ired kangaroo unokuthi ialtricial? (2)

2.3 Idayagram engezanyisi ibonisa icross section yemehlo.



2.3.1 Nika iGAMA noMSEBENZI omNYE wezi ndawo zilandelayo:

(a) **A** (2)

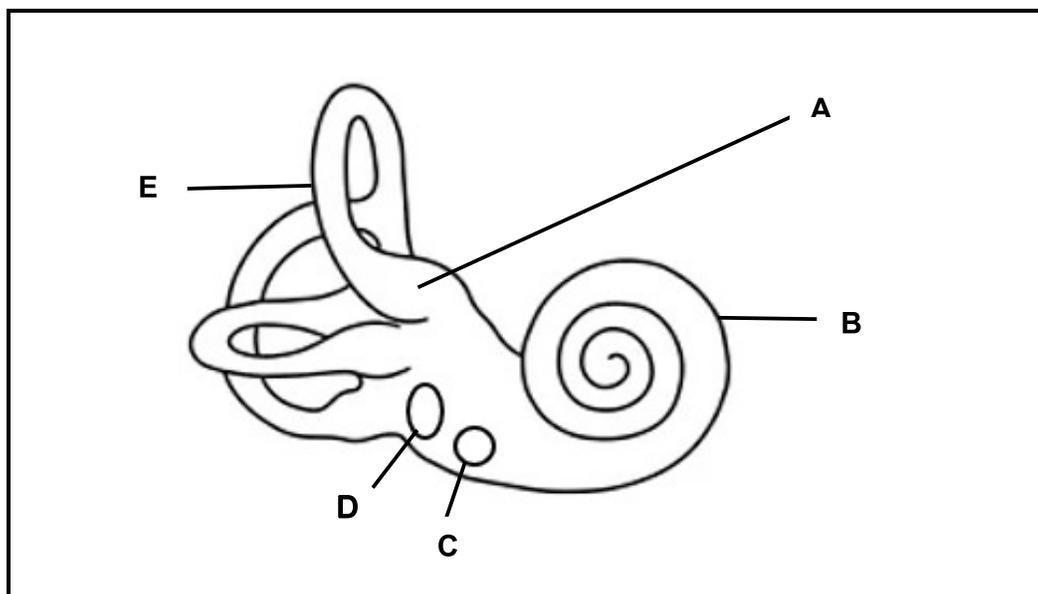
(b) **B** (2)

2.3.2 Ipolycoria sisifo esichaphazela indawo uC. Umntu onesi sifo ubaneepupil ezingaphezu kwesinye. Ipupil nganye ibaneset yayo yeecircular muscles.

Gqabagqaba chaza ukuba esi sifo sikuchaphazela njani ukubona. (3)

2.3.3 Chaza iinguqu ezenzeka kwimehlo lomntu ojonge into ekumgama oziimetre ezintathu ukusuka kuye. (5)

2.4 Idayagram engezantsi iboonisa istrakhisha seinner ear.



2.4.1 Nika iLETA neGAMA lendawo e:

- (a) Fumana iivibration kwiiossicle iziguqule zibeziipressure wave (2)
- (b) Neorgan of Corti (2)

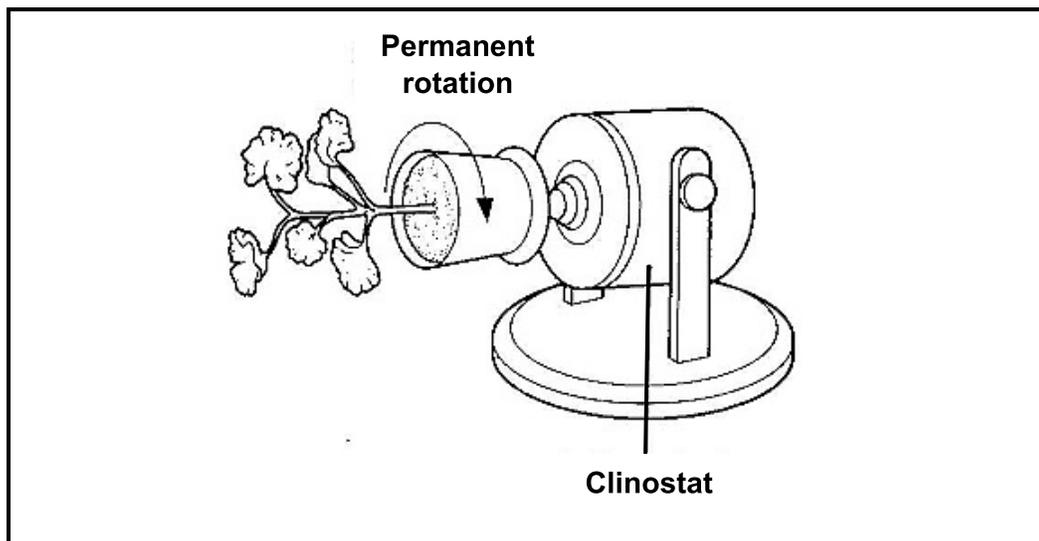
2.4.2 litop ice-figure skater zingaspinna umzimba wazo amatyeli aya ku6 ngesecnd.



Chaza indima edlalwa yindawo uA ukugcina ibalance yomzimba wazo xa zispinna. (4)

2.4.3 Chaza ibeNYE indlela indawo uB elungiselelwe ngayo ukwenza umsebenzi. (2)

- 2.5 Iexperiment engezantsi ibonisa isityalo esasibekwe kwiclinostat ejikelezayo endlwini emnyama.



- 2.5.1 Xela itropism etestwa kule experiment. (1)
- 2.5.2 Cacisa ngokuzathuza ukuba ingcambu yale mbewu ilindeleke ukuba ikhule ibheke ngaphi. (3)
- 2.5.3 Chaza kutheni istem sesityalo sizakukhula siye kwiunilateral light. (3)
- 2.5.4 Xela zibeMBINI iidefence mechanism ezisetyenziswa sisityalo ekuzikhuseleni ekutyiweni zizilwanyana. (2)

**[50]**

**UMBUZO 3**

3.1 Abaphandi baqhuba uphando lwegalelo lwemicroplastic bioaccumulation kwifertility levels zeenkunzi zeempuku. Imicroplastic ziiplastic ezinqunqwe zaziiplastic ezincinci, umzimba awunakuziguba uzikhuphe nto leyo yenza ukuba zande egazini emva kwexesha. Ukwanda kwazo egazini kubizwa ngokuba yibioaccumulation.

Uphando lwaqhutywa ngolu hlobo:

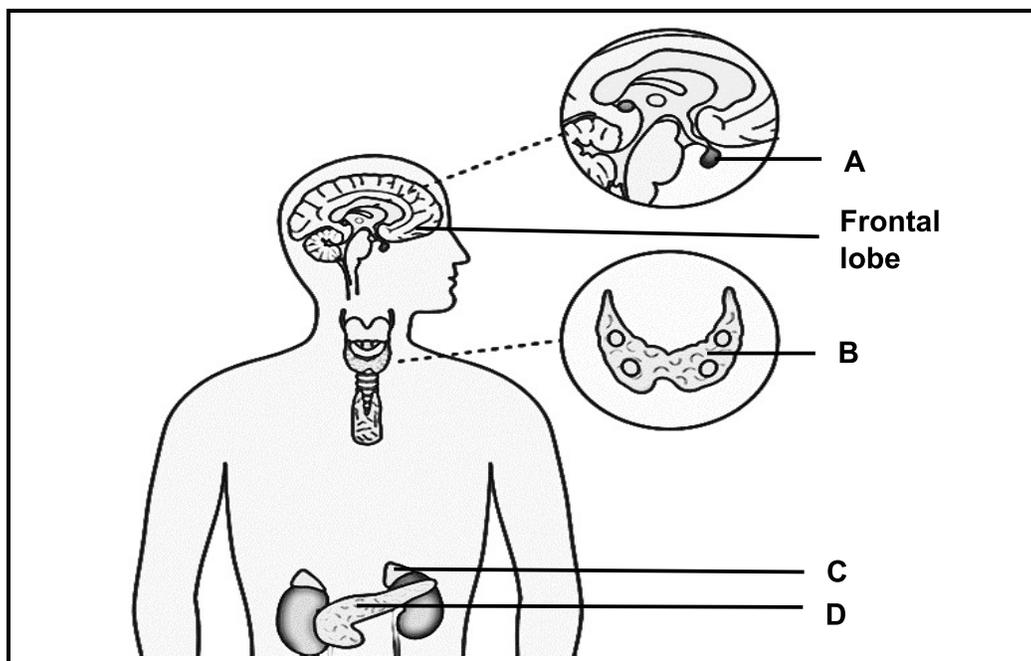
- Iinkunzi zeempuku ezingama60, zonke ziziAlbino Wistar sp. zohlulwahlulwa ngokulinganayo amaqela amathathu.
- Iimpuku kuwo onke amaqela zaziphilile zisitya ukutya okufanayo.
- Iqela 1 lalisela amanzi ane0,0  $\mu\text{m}/\ell$  microplastics yonke imihla.
- Iqela 2 lalisela amanzi ane4  $\mu\text{m}/\ell$  of microplastics yonke imihla.
- Iqela 3 lalisela amanzi ane10  $\mu\text{m}/\ell$  microplastics daily.
- Iiscientist zaluqhuba uphando iintsuku ezingama90.
- Ixesha ngalinye kuphele iintsuku ezingama30 iiscientist bezitsala igazi ziteste amaqondo etestosterone ( $\text{ng}/\text{m}\ell$ ) kuzo naziphi iimpuku ezili10 zeqela ngalinye, iavareji yeqela ngalinye yabalwa.

Iziphumo zabalolu hlobo:

	AMAQONDO ETESTOSTERONE ( $\text{ng}/\text{m}\ell$ )		
	IQELA 1 0,0 $\mu\text{m}/\ell$	IQELA 2 4 $\mu\text{m}/\ell$	IQELA 3 10 $\mu\text{m}/\ell$
<b>DAY 0</b>	28 $\text{ng}/\text{m}\ell$	25 $\text{ng}/\text{m}\ell$	26 $\text{ng}/\text{m}\ell$
<b>DAY 30</b>	26 $\text{ng}/\text{m}\ell$	19 $\text{ng}/\text{m}\ell$	17 $\text{ng}/\text{m}\ell$
<b>DAY 60</b>	27 $\text{ng}/\text{m}\ell$	14 $\text{ng}/\text{m}\ell$	8 $\text{ng}/\text{m}\ell$
<b>DAY 90</b>	26 $\text{ng}/\text{m}\ell$	10 $\text{ng}/\text{m}\ell$	3 $\text{ng}/\text{m}\ell$

- 3.1.1 Cacisa ngokuzathuza ibeNYE indlela abaphandi abaqinisekisa ngereliability yophando lwabo. (2)
- 3.1.2 Xela ibeNYE indlela abaphandi ababemele ukuba bayilandele ukunyusa ivalidity yeziphumo zophando olungasentla. (1)
- 3.1.3 Independent variable yameasurishwa njani kolu phando? (1)
- 3.1.4 Cacisa ngokuzathuza ukuba kutheni iqela 1libalulekile kolu phando. (3)
- 3.1.5 Xela iconclusion kolu phando. (2)
- 3.1.6 Chaza iprowusesi yespermatogenesis. (4)
- 3.1.7 Sichaphazeleke njani ispermatogenesis seqela 3 emva kweentsuku ezingama90? (2)

3.2 Idayagram engezantsi imele iiendocrine gland zomzimba womntu.



3.2.1 Xela amadlala u:

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

3.2.2 Yintoni umsebenzi we'negative feedback mechanism' eredyuleyitha idlala u**B**? (2)

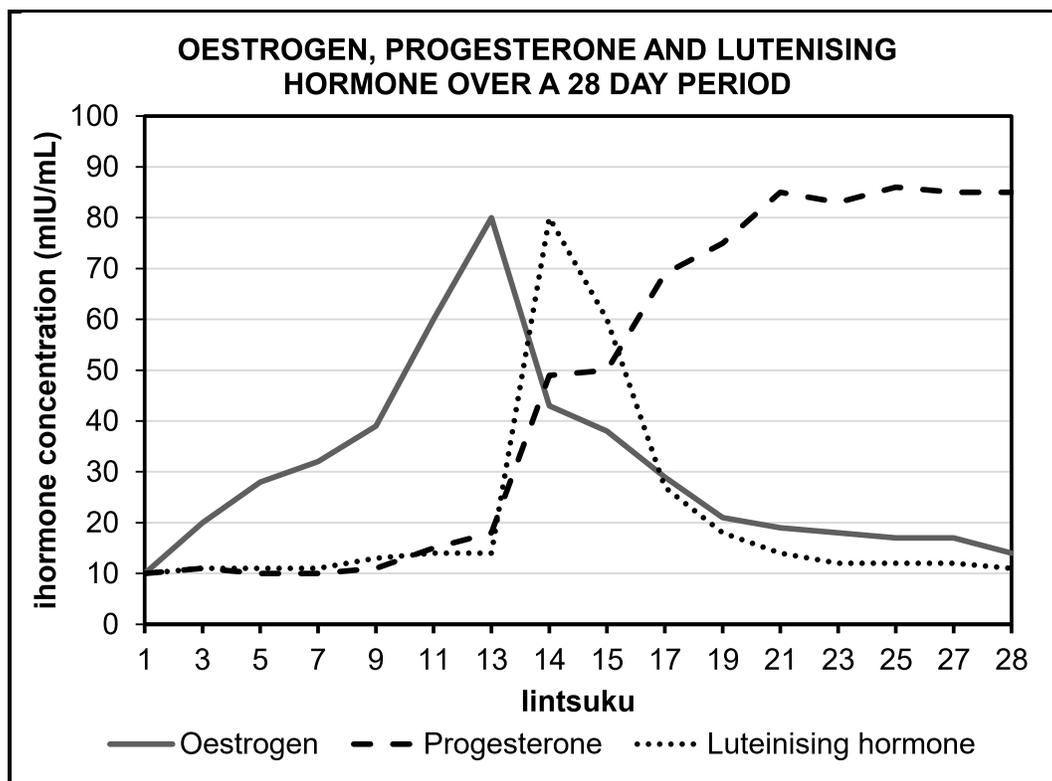
3.2.3 Cacisa ngokuzathuza ukuba kutheni idlala u**D** liyixocrine liphinde libeyiendocrine gland ngaxeshanye. (4)

3.2.4 Chaza ukuba idlala u**C** unokuyinyusa njani iglucose neoxygen eya kwiskeletal muscles ngexesha le-emergency. (5)

3.2.5 Ngenxa yetumour ekhula kwifrontal lobe yengqondo, iigrowth hormone (GH) ezigqithisileyo zingasecrethwa.

- (a) Yeyiphi indawo engqondweni escreteha iigrowth hormone (GH)? (1)
- (b) Xela libeli**NYE** igama lemeko ebasemntwini omdala eyenziwa yigrowth hormone (GH) egqithisileyo. (1)

- 3.3 Igrafu engezantsi ibonisa iinguqu ezenzeka kwiihormone zebhinqa ngexesha le menstrual cycle.



- 3.3.1 Xela izistrukture ezisecretha:
- (a) loestrogen ukusuka ngosuku 1–13 (1)
- (b) lprogesterone ukusuka ngosuku 13–20 (1)
- 3.3.2 Kungaluphu usuku apho kwenzekile ivulation? (1)
- 3.3.3 Nika isizathu sempendulo yakho ekuMBUZO 3.3.2. (1)
- 3.3.4 Cacisa ngokuzathuza ukuba kutheni amaqondo eprogesterone ehlala epehezulu emva kosuku lwama21. (2)
- 3.3.5 Kutheni ingenakwenzeka into yokuba ibhinqa libenenye iGraafian follicle edvelophayo xa limithi? (4)
- 3.4 Ngexesha leintense exercise, amaqondo ecarbon dioxide egazini nobushushu bomzimba buyanyuka.
- 3.4.1 Chaza ihomeostatic control yecarbon dioxide xa inyuke kakhulu egazini. (7)
- 3.4.2 Chaza ukuba kuyakwenzeka ntoni emzimbeni wembaleki xa umzimba wayo ungenako ukuthoba ubushushu. (3)

[50]

EWONKE AMANQAKU ECANDELO B: 50  
EWONKE AMANQAKU: 150