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Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

KEREITI 12

LOETSE 2021

**DISAENSE TSA BOPHELO P1
TATAISO YA HO TSHWAYA**

MATSHWAO : 150

Tataiso ena ya ho tshwaya e na le maqephe a 11

MELAO THEO O AMANENG LE HO TSHWAYWA DISAENSE TSA BOPHELO

1. **Haeba ho fanoa ka lesedi le fetang la dimaraka tse fanweng**
Emisa ho tshwaya ha matshwao a holimo a fihletsoe ebe o beha mola oa wavy le 'max' ka lehlakoreng le letona la letsoho le letona.
2. **Haeba, ho etsa mohlala, ho hlokahala mabaka a mararo mme ho fanoe ka a mahlano**
Tshwaya tse tharo tsa pele ho sa tsotelehe hore na kaofela kapa tse ding di nepahetse / di fosahetse.
3. **Haeba tshebetso yohle e fanwa ha ho hlokahala feela karolo ya yona**
Bala tsohle mme o tlotlise karolo e amehang.
4. **Haeba papiso e kopwa, empa ho fanwa ka ditlhaloso**
Amohela haeba phapang / ho tshoana ho hlakile.
5. **Haeba ho baloa ka tatellano ho hlokahala, empa ho fanwe ka dirapa**
Bakhethi ba tla lahlehelo a ke dimaraka ka ho se kenye lethathamo.
6. **Haeba ditshwantsho di fanwa ka ditlhaloso ha ditlhaloso di hlokahala**
Bakhethi ba tla lahlehelo a ke dimaraka.
7. **Haeba ditjhate tsa phallo di fanwa sebakeng sa ditlhaloso**
Bakhethi ba tla lahlehelo a ke dimaraka.
8. **Haeba tatellano e sithabelitsoe mme lihokela ha li utloahale**
Moo tatellano le dihokela di nepahetseng, mokitlane. Ha tatellano le dihokela di fosahetse, o se ke wa etsa mokitlane. Haeba tatellano le dikhokahano di nepahala hape, qalella mokitlane.
9. **Dikhutsufatso tse sa tsejweng**
Amohela haeba e hlalositsoe pele. Haeba e sa hlaloso a, se ke wa fana ka mokitlane oa khutsufatso e sa tsejweng, empa fana ka karabo karolong e setseng haeba e nepahetse.
10. **Dinomoro tse fosahetseng**
Haeba karabo dumellana le tatellano e nepahetseng ea dipotso, empa ho fanwe ka nomoro e fosahetseng, hoa amoheleha.
11. **Haeba puo e sebedisitse fetola moelelo o reriloeng**
Se ke oa amohela.
12. **Diphoso tsa mopeleto**
Haeba e tsebahala, amohela karabo, ha feela e sa bolele ho hong ho tsa Saense ea Bophelo kapa haeba e sa tsamaellane le maemo.

13. **Haeba mabitso a tlwaelehileng a fanwa ka mantswa**
Amohela, ha feela e ka amoheloa kopanong ea naha ea lipuisano.
14. **Haeba feela ho botswa lengolo, ho fanwa ka lebitso feela(le ho fapana)**
O seke wa ikotla
15. **Haeba diyuniti ha di fanwe ka tekanyo**
Bakgethi ba lahlehelwa ke matshwao. Memorandamo etla fana ka dimaraka tsa dikarolo ka thoko.
16. **Ela hloko kutwisiso ya karabo,e ka buuwang ka tsela e fapaneng**
17. **Tlhaloso**
Ditshwantsho tsohle (ditayakramo, dikerafo, ditafole, jwalo jwalo.) .etlameha hoba le sehloho.
18. **Ho fetola puo tsa molao (dipolelo le dikgopolo)**
Lentsoe le le leng kapa a mabedi a hlahang (dipuong) ka puo efe kapa efe ya semmuso ntle le puo ya tekolo ya moithuti e sebelisitsoeng haholo ho dikarabo tsa hae a lokela ho fuwa tlotla, haeba e nepahetse. Lesupa le nang le tsebo ea puo ea semmuso e loketseng le lokela ho botsoa. Sena se sebetsa dipuong tsohle tsa semmuso.

KAROLO YA A

POTSO YA 1

- | | | | | |
|-----|--------|---|-------------|------|
| 1.1 | 1.1.1 | D✓✓ | | |
| | 1.1.2 | A✓✓ | | |
| | 1.1.3 | B✓✓ | | |
| | 1.1.4 | A✓✓ | | |
| | 1.1.5 | A✓✓ | | |
| | 1.1.6 | C✓✓ | | |
| | 1.1.7 | C✓✓ | | |
| | 1.1.8 | A✓✓ | | |
| | 1.1.9 | C✓✓ | | |
| | 1.1.10 | A✓✓(10 x 2) | | (20) |
| 1.2 | 1.2.1 | | | |
| | 1.2.2 | Peripheral✓nervous system | | |
| | 1.2.3 | Dendrite✓ | | |
| | 1.2.4 | Geotropism✓ | | |
| | 1.2.5 | Round window✓ | | |
| | 1.2.6 | Thyroxin✓/adrenalin | | |
| | 1.2.7 | Adrenal gland✓ | | |
| | 1.2.8 | Vagina✓ | (8 x 1) | (8) |
| 1.3 | 1.3.1 | B feela ✓✓ | | |
| | 1.3.2 | A le B ka bobedi ✓✓ | | |
| | 1.3.3 | B feela ✓✓ | (3 x 2) | (6) |
| 1.4 | 1.4.1 | D→C→A✓✓ | | (2) |
| | 1.4.2 | Ho sireletsa✓/ho fokotsa kotsi mmeleng | | (1) |
| | 1.4.3 | - Mesifa✓
- Tshwelesa✓
- | (Any 1 x 1) | (1) |
| | | (Tshwaya ya pele ELENGWE feela) | | |
| | 1.4.4 | (a) C✓ – Interneuron✓/connector neuron | | (2) |
| | | (b) B✓ – Ventral root✓ | | (2) |
| | | (c) A✓ – Motor neuron✓ | | (2) |

1.5	1.5.1	(a)	Tshwelesa ya qoqotho✓	(1)
		(b)	Testes✓	(1)
	1.5.2	(a)	Pituitary✓gland/Hypophysis	(1)
		(b)	TSH✓/Thyroid stimulating hormone	(1)
		(c)	Adrenal gland✓	(1)
	1.5.3	A✓		(1)

MATSHWAO OHLE A KAROLO YA A: 50

KAROLO YA B

POTSO YA 2

- 2.1 2.1.1 Ho nontshwa ka ntle (1)
- 2.1.2 Mahe a nontshwa ka sebopeho sa kantle sa banna (mokotla oa bana) / mahe ha a nontshwa kahare ho basadi. (1)
- 2.1.3 - Lenane la mahe amangata le behetswe✓ ka hara poutjhe ka mokgwa wa hoeketsa monyetla wa ho nontsha✓
 - Manyolo a etsahala ka har'a mokotla
 - ho eketsa menyetla ea manyolo✓
 - Ntshetsopele ya diboko / embryo e etsahala ka har'a mokotla, ✓
 - ka hona ba sirelelitsoe liphoofoelong✓ / mabaka afe kapa afe a tikoloho (efe kapa efe 2 x 2) (4)
- 2.1.4 - Kgōlo ya mahe a emodisitsoeng e etsahala ka mokotleng wa monna
 - Vivipary e etsahala ka popelong✓
 - Mahe a emodisitsweng a fepwa ke yolk ea mawatlle a mahe a dinotši
 - Ho vivipary mahe a emolisitsoeng a fepuo a ke li-placenta✓
 - Mokelikeli o patehileng ka har'a mokotla o thusa phallo ea phallo le khase ✓
 - Ho vivipary placenta e thusa phapanyetsano ya phallo le khase ✓
 (Tshwaya pele ELENNGWE feela) (efe kapa efe 1 x 2) (2)
- 2.2 2.2.1 Nako ea kholo ea lesea le ka pōpelong pakeng tsa kemolo le pelehi (2)
- 2.2.2 Matsatsi a 22✓
- 2.2.3 Palo ea progesterone✓ (1)
- 2.2.4 E tshwanang:
 - Mefuta ya dikhoto✓
 - Khakanyo ya progesterone e entilwe✓
 - Mofuta / mofuta wa progesterone✓
 - Boemo ba tshebetso ya dikhoto✓
 - Boemo ba bophelo ba dikhoto✓
 - Mofuta wa dijo✓ (efe kapa efe 2 x1) (2)
 (Tshwaya pele habedi feela)
- 2.2.5 - Ovary e ntsha progesterone✓ ka hona,
 - Ho tlosoa ha ovary ho nolofalletsa mofuputsi ho tsamaisa mefuta e fapaneng ea progesterone✓
 - ho bapisa phello ya yona nakong ya kemaro✓ (3)

- 2.2.6 - Palo ya dikhoto tse phethileng kemaro di arotswe ke palo ya dikhoto sehlopheng ka seng ✓
- mme e atisitswe ka 100 ✓ (2)
- 2.2.7 - Ho sebetsa joalo ka taolo ✓
- e le hore e ka bapisoa ✓ ledihlopha tse ding
- ho fumana hore na progesterone e ama katleho e atlehileng ya bokhatjhane (efe kappa efe 2 x 1) (2)
- 2.3 2.3.1 (a) **A** – Suspensory ligament ✓ (1)
(b) **B** – Iris ✓ (1)
- 2.3.2 Ho tshireletsa leihlo ✓ (1)
- 2.3.3 - Dicyliary muscles di akgatholoha ✓
- Disuspensory ligaments diya ✓ tiya
- Tsitsipano e ho lense eya eketseha
- Lense eya batalla ✓/ebe khonvekse ha nyane
- Matla a refractive ya lense eba nyane ✓/mahlasedi a kganya kobehileng ha nyane
- Mahlasedi a letsatsi a tsepametse ho leihlo' retina' ✓
- Ho etsa setshwantsho se hlakileng (efe kapa efe 4 x 1) (4)
- 2.3.4 - Ha hona tshusumetso etswang eka fetisetwang ✓
- Ho cerebrum ✓
- eka qetellang e etsa tahlehelo ya hose bone ✓ (3)
- 2.4 2.4.1 Motjhini o bolokang tikoloho e kahare ✓✓ (2)
- 2.4.2 - (Cold)di receptors/dithermoreceptors tse letlalong di ya susumelletseha ✓
- Ho fetisetse tshusumetso e tswang ho hypothalamus ✓
- hypothalamus tshusumetso etswang ho
- Methapo ya madi a letlalo
- Di tshwelesa tsa mofufutso ✓
- Methapo ya madi a letlalo e ya kgutsufala ✓ (vasoconstriction)
- Madi a phalla ha nyane hoye letlanong ✓ le
- Le ho fela ha motjheso ✓ mmeleng
- Madi atswang ha nyane a fetisetsewa ho di tsholesa tsa mofufutso
- Ho hlahiswa mofufutso ofokolang ✓ le
- motjheso o monyane ✓ wa mofufutso
- motjheso wa mmele oya nyoloha ebile oya laoleha (efe kapa efe 7 x1) (7)
- 2.4.3 - Enzymes ha di sasebetsa ✓
- Di fedisa tshebetso ya methaboliki ✓/ e theola
- E etella phetapheto ya ho hloleha ha ditho tsa mmele ✓/ ha o heme / ha ho matla a tswang (3)

- 2.5 2.5.1. Tšoelesa ea senya ✓ (1)
- 2.5.2 Ho tsamaisa peo ya botona le moroto ✓ (1)
- 2.5.3 - Botona ba ntate bo hloka 2°C bonyane ho feta motjheso ba mmele✓
- Ho hlahisa botona ba ntate tse bophelong✓
- Ka hona,, ha letsatsi le tjhesa,mokotla wa botona o lokisetsa hontsha botona mmeleng ✓
- Ho qoba ho kopana le mmele✓
- Ho boloka mofuthu o tlase✓(Any 3 x 1) (3)
- 2.5.4 Engwe ya di vas deferense eile ya kwalwa ka mokgwa wa ho buuwa✓
- Ka hona,semen le sperm di tsamaiswa ka lehlakore le leng✓/peo ya botona ba ntate botswa botoneng ba ntate(testis) (2)

[50]

POTSO YA 3

- 3.1 3.1.1 Mothapo wa ho utlwa✓ (1)
- 3.1.2 Tekanyo ya kгатello ka mahlakoreng a lera la tympanic✓ (1)
- 3.1.3 (a) Pinna✓ (1)
- (b) Organ of Corti✓ /Cochlea (1)
- 3.1.4 (a) - Di ossicles ha di tsitsinyehe ✓
 - Ka hona, tsitsinyeho ha e kgone ho fetela ho oval window✓
 - Le kгатello ya maqhubu ha e kgone ho bateng bohareng ba tsebe ✓/
 - Organ of Corti ha e susumetswe ke ho hlahisa tshusumetso e tswang ✓/ha ho tshusumetso e ka ronyelwang ho ya bokong bakeng sa ho mamela (efe kapa efe 3 x 1) (3)
- (b) - Karolo D/ lera la tympanic ha lena ho kgona ho hlahisa thothomelo✓
 - Ha ho thothomelo eka ronyelwang di ossicles✓/ oval window
 - Ka hona,ha ho kгатello ya maqhubu e ka etsahalang ✓
 - Organ of Corti ha e susumetswe ke ho hlahisa tshusumetso etswang/e ka ronyelwang ho ya bokong bakeng sa ho mamela (efe kapa efe 3 x 1) (3)
- 3.1.5 - Cristae di ya hlasimoloha✓
 - Ho fetola hlasimollo ho ba tshusumetso✓
 - e fitiswang ka methapo ya tsebe✓
 - hoisa ho cerebellum✓ moo ho tolokwang teng
 - cerebellum e romela tshusumetso e tswang ho mesifa ya masapo ✓/ ho boloka tekano (efe kapa efe 4 x 1) (4)
- 3.2 3.2.1 (a) - Ho tlosa di auxins✓tse hlahang ho di apical bud (1)
- (b) - Ho dumella di auxins ho monyela ka hara di boloko tsa agar✓ (1)
- 3.2.2 - Di auxin di tla hasanela lehlakoreng le letshehadi ✓la dikutu
 - Hona le tsepamiso ematla ka hodimo ya diauxin ka lehlakoreng le letshehadi la dikutu
 - Tsepamiso ematlaka hodimo yadi auxin etlasusumeletsa ho hola ha di sele✓/ho mela ho lehlakoreng le letshehadi
 - Ho se mele hantle✓
 - Ho ka etsa kutu ekobehele ka lehlakoreng le letona ka ho kobela nthla ya kutu lehlakoreng la letsoho le letona ✓*
***1 Eya qobella+ efe kapa efe 3 (4)**

- 3.2.3 - Di auxin di tla monyela lehlakoreng le kganyang✓ (letsohong leletona)
 - Efetele ho lehhaore le lefifi ✓ (ka letsohong le letshehadi)
 - Tsepamiso ematla e hodimo e lehlakoreng le lefifi etla susumetsa ho hola ha di cell ✓/ di hola ho feta lehlakoreng le kganyang
 - Ho se hole hantle✓
 - Hoetsa dikutu di kobehekele hlakoreng le letona ho ya kganyeng ✓* (ka letsohong leletona) *1 Eya qobella +efe kapa efe 3 (4)
- 3.2.4 - makala amangata a matjha ahlaha ✓
 A eketsa kgefutso✓
 - Ditholwana di bonahlal hara makala nolofalletsa kotulo e bonolo✓ (Any 1 x 2) (2)
(Tshwaya ya pele ele NNGWE feela)
- 3.3 3.3.1 (a) Insulin✓
 (b) Manyeme✓ (1)
- 3.3.2 Maikutlo a mabe✓ mekgwa/ homeostasis (1)
- 3.3.3 Nakong ea ho itima dijo ha ho dijo tse jewang ka hona
 - Tekanyo ya tswekere e thehela tlase ho tlwaelehileng✓
 - Manyeme a ke ke a hlohlelletswa ho hlahisa insulin✓ / ka tlase ho tla patwa / boemo ba insulin bo tla theoha (2)
- 3.3.4 - Ha boemo ba tswekere bo theoha ka tlase ho maemo a tloaelehileng
 - manyeme a hlohlelletsoa ho ntsha glucagon✓ e ngata hormone B
 - e hlohlelletsang phetoho ea glycogen ho glucose✓
 - ho phahamisa maemo a tswekere ho khutlela setloaeding (4)
- 3.4.1 (a) Amniotic fluid✓ (1)
 (b) Chorion✓ (1)
- 3.4.2 Umbilical vein✓ (1)
- 3.4.3 - E sebetsa e le sehokelo sa lesea le sa tsoa emoloa ho mme✓
 - E dumella ho hasanngoa ha dijo tse qhibilihileng ho tloha ho mme ho ea ho boitumelo
 - E dumella phallo ea oksijene ho tloha ho mme ho ea ho foetus✓
 - E dumella ho hasana ha carbon dioxide ho tloha lesea le sa le popelong
 - E dumella ho hasana ha ditshila tse nang le naetrojene tse tsoang holesea ho me
 - E boloka progesterone✓ e bolokang bokgatjhane
(Tshwaya tsa pele tse PEDI feela) (efe kapa efe 2 x 1) (2)

- 3.4.4 - Zygote e arolwa ke mitosis ✓
 - Ho theha bolo (e tiileng) ea lisele ✓
 - ebitswa morula ✓
 - e arolang hape ho etsa bolo e sekoti ea lisele ✓
 - e bitsoang blastocyst ✓ / blastula
 - Disebeliswa tsa blastocyst / blastula ho endometrium ✓ / Sena se bitswa ho hlangoa
 - Lera le ka ntle la "embryo" le fetoha chorion ✓ le
 - lera le ka hare le fetoha amnion ✓
 - ka lero la amniotic ka hare ✓
 - Kamora ho hlangoa chorion e ba le ikhahla tse ngata tse kang menwana ✓
 - e bitswang chorionic villi ✓
 - Endometrium ha mmoho le chorionic villi di theha placenta ✓
 (Efe kapa efe 8 x 1) (8)
- 3.4.5 - Sekoti se sekoti ✓
 ho amohela phokojwe e ntseng e hola
 - Mesifa ✓
 Ho etsa konteraka le ho phomola ho thusa ho beleha ✓
 - Kamohelo ✓
 ho otlolla ho amohela phokojwe e ntseng e hola
 (Leha e le efe 2 x 1) (2)
- [50]

MATSHWAO OHLE A KAROLO YA B: 100
MATSHWAO OHLE A PAMPIRII ENA: 150