

SECTION A

Question 1

1.1

- 1.1.1 C✓✓
- 1.1.2 C✓✓
- 1.1.3 C✓✓
- 1.1.4 B✓✓
- 1.1.5 C✓✓

(5 x 2) (10)

1.2

- 1.2.1 Podocytes✓
- 1.2.2 Radiation/Conduction✓
- 1.2.3 Osmosis✓
- 1.2.4 Negative feedback✓
- 1.2.5 (Renal) pelvis✓
- 1.2.6 Xerophytes /succulents✓
- 1.2.7 Plasmolysis✓

From 2005, Prefix "renal" must be used

(7)

1.3

- 1.3.1 E✓✓
- 1.3.2 I✓✓
- 1.3.3 A✓✓
- 1.3.4 C✓✓
- 1.3.5 D✓✓
- 1.3.6 B✓✓

(6 x 2) (12)

1.4

1.4.1 Conjunctiva ✓

(1)

- 1.4.2 (i) G ✓
- (ii) A /F✓
- (iii) D ✓
- (iv) E ✓
- (v) B ✓(H)

(5)

1.4.3

| F | A |
|------------------------------|---------------------------------------|
| • Is transparent ✓ | • Is not transparent / is opaque ✓ |
| • Lets light through ✓ | • Does not let light through✓ |
| • Refract / bend light rays✓ | • Does not refract / bend light rays✓ |

Any matching difference

(2 x 1)

Mark first 1 only

(2)

- 1.4.4 - Retina ✓
 - receives light stimulus / changes stimulus into an impulse ✓ (2)
(10)

1.5

1.5.1

- add a layer of oil on top of the water ✓
 to prevent evaporation of water from the cylinder ✓
- OR**
- set up a control ✓ / (accept a description of the control)
 to verify / compare the results ✓

(2)

1.5.2 $\frac{120 - 88}{120} \times 100 = 26,7\% / 27\%$ ✓

OR

$\frac{32}{120} \times 100 = 26,7 / 27\%$ ✓

OR

$\frac{88}{120} \times 100 = 73,3\% / 73\%$

Hence $100\% - 73,3\% / 73\% = 26,7\% / 27\%$ ✓

(3)

- 1.5.3 (i) Remove the leaves from the plant / use a leafless twig ✓✓

OR

Put Vaseline / oil on both sides of the leaves ✓✓

OR

Put Vaseline / oil on all the parts except the leaves ✓✓

(2)

- (ii) cover the lower / upper surfaces of the leaves with Vaseline / oil ✓✓ (2)

1.5.4

- vessels and tracheids are non-living/has a lumen/no cell contents ✓
 - made up of a series of tubular vessels /round ✓
 - vessels and tracheids are elongated tubes /cells joined end to end ✓
 - ends of tracheids overlap one another ✓
 - walls are thickened/strengthening ✓ with lignin
 - walls are perforated with numerous pits ✓
 - small diameter ✓ of xylem vessels
 - cross walls in xylem perforated/absent ✓
- Mark first 2 only**

(2)
(11)

Total Question 1: 50

TOTAL SECTION A: 50

SECTION B

Question 2

2.1

2.1.1 Endodermis ✓

(1)

2.1.2

- finger like /large surface area ✓
 - a large vacuole ✓
 - thin layer of cytoplasm ✓
 - cell membrane / tonoplast is differentially permeable ✓
 - absence of cuticle ✓
 - thin cell wall ✓
 - porous /permeable to water ✓
- Mark first 4**

(4)

2.1.3

- H₂O moves from cell to cell internally along the cell walls ✓
and intercellular air spaces ✓
by diffusion ✓
 - H₂O moves from cell to cell ✓ / parenchyma to endodermis ✓ and endodermis to
pericycle ✓
via the cell membranes ✓
through the cytoplasm/ vacuole ✓
by osmosis ✓ any 3
- Mark first 2 pathways 2x3**

(6)
(11)

2.2

2.2.1 14h00 (1)

(1)

2.2.2

- plant A has a **thinner** cuticle/plant B has a **thicker** cuticle ✓✓
- plant A has **thinner** leaves/plant B has **thicker(more fleshy)** leaves ✓✓
- plant A has a single layer of epidermis/plant B has more than one layer of epidermis ✓✓
- plant A has no sunken stomata/has exposed stomata/plant B has sunken stomata ✓✓
- plant A has no hair-like structures(trichomes)/plant B has hair-like structures(trichomes) ✓✓
- plant A has **larger** leaves/plant B has **smaller** leaves ✓✓
- plant A has **more** stomata/plant B has **fewer** stomata ✓✓
- stomatal pores of plant A **bigger**/stomatal pores of plant B are **smaller** ✓✓
- plant A has stomata on both sides of the leaves/stomata mainly on the lower surface of the leaf in plant B ✓✓

Mark first 3

3x2 (6)

(7)

2.3

2.3.1

- photosynthesis ✓ takes place in the chloroplasts of the guard cells
- glucose ✓ is produced
- potassium ions ✓ move into the guard cell
- which lowers the water potential of the guard cells ✓
- water moves from higher water potential ✓
- in the surrounding epidermal cells ✓
- into the guard cells ✓
- by osmosis ✓
- the guard cells become turgid ✓
- the thin outer walls of the guard cells stretch outwards ✓
- the thick inner walls pull away from the pore, opening the pore ✓

any (5)

2.3.2 light ✓

CO₂ concentration ✓

wind ✓

water ✓

temperature ✓

humidity ✓

climatic conditions ✓ (can be accepted as an an alternative to all of the above factors)

Mark first 2

(2)

(7)

Total Question 2: 25

Question 3

3.1

3.1.1 B – proximal convoluted tube ✓
C – loop of Henlè /descending limb of Henlè ✓
D – collecting ducts /duct of Bellini ✓ (3)

3.1.2 urine ✓ (1)

3.1.3 C ✓and D ✓ (2)

3.1.4

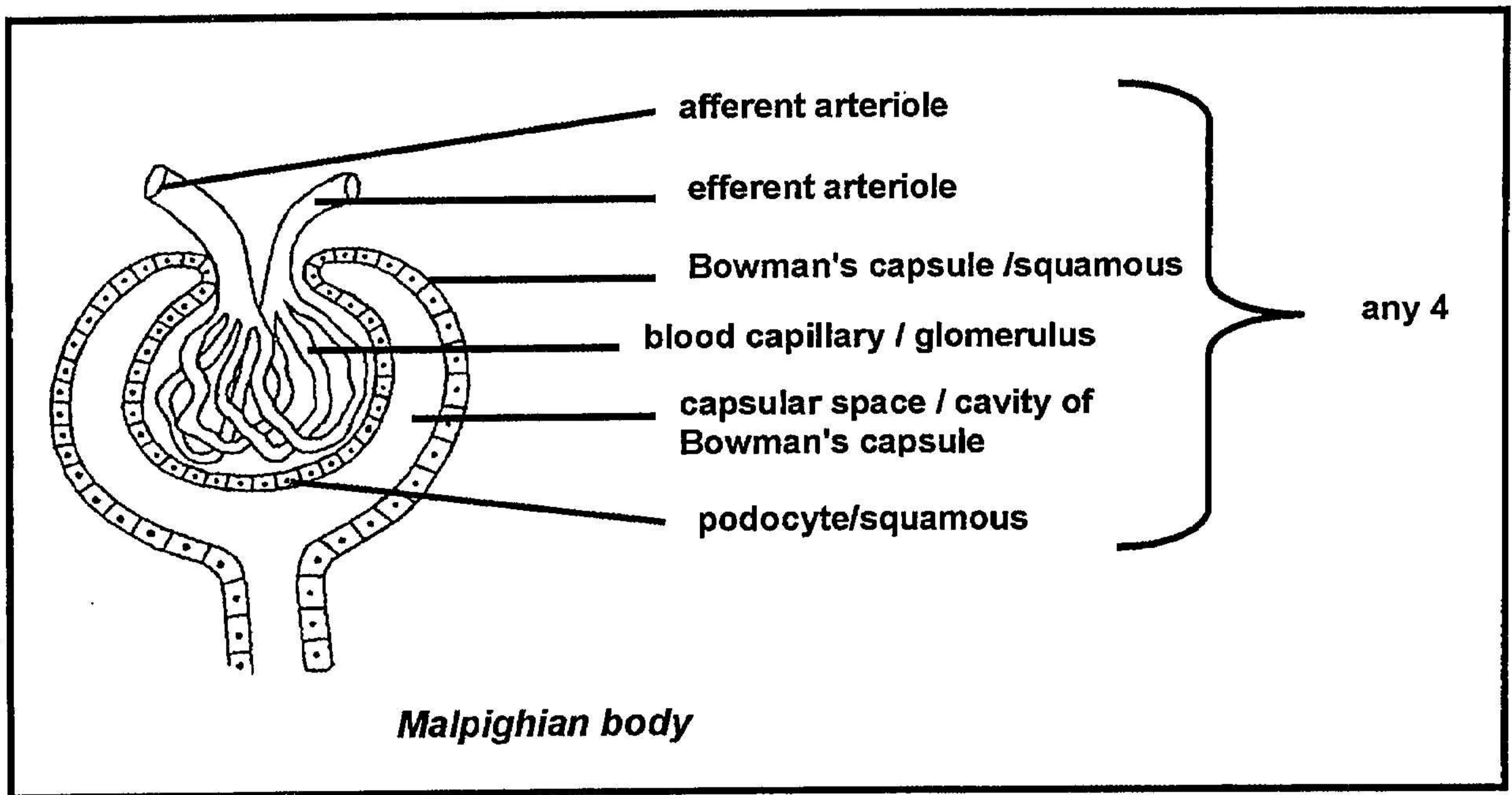


Diagram: Afferent arteriole is wider than efferent arteriole ✓

A cup shaped structure ✓

Caption : Malpighian body ✓

Labels : Any FOUR correct labels pointing to the appropriate structure ✓✓✓✓

(7)

3.1.5

- many microvilli ✓
to enlarge surface area/contact area with filtrate ✓
- many mitochondria ✓
to supply energy ✓ for active transport
- folding of basement membrane ✓
to enlarge surface area/contact area with filtrate ✓

Mark first 2 2x2 (4)
(17)

3.2

3.2.1 880 000 ✓ arbitrary units ✓

(2)

3.2.2

- glucose is completely reabsorbed ✓
- from the proximal convoluted tubules ✓
- therefore no glucose is excreted ✓

any (2)

3.2.3 Uric acid ✓
Creatinine ✓
Creatine ✓
Ammonia ✓
Hippuric acid ✓

Mark first 2 any (2)

3.2.4 diabetes ✓ mellitus

(1)

3.2.5 ADH/vasopressin ✓

(1)

(8)

Total Question 3: 25

Question 4

4.1

4.1.1 A – cerebrum ✓
B – cerebellum ✓
C – medulla oblongata ✓ (pons)
D – spinal cord ✓

(4)

4.1.2

- transmits impulses to/ from the brain ✓
- It contains reflex centres ✓

Mark first 2 (2)

4.1.3 reflex arc/receptor/neuron/nerve/spinal cord/effector ✓ (1)

4.1.4

- the receptor ✓ converts the stimulus to an impulse
- which is transmitted to the sensory /afferent neuron / (through dorsal root of spinal nerve) ✓
- and then to the interneuron /connector/relay/association neuron/spinal cord ✓
- which transmits the impulse to the motor/efferent neuron/ (through ventral root of spinal nerve) ✓
- the motor neuron carries impulses to the effector /muscle ✓ (5)

4.1.5

- To allow an individual to react or respond fast ✓ enough to a stimulus to prevent further damage ✓ to the tissues. **Mark first advantage** (2)

(14)

4.2

4.2.1 B - tympanic membrane/ ear drum ✓

C - malleus/hammer ✓

D - semicircular canals ✓

F - cochlea ✓

(4)

4.2.2

- Has many ridges ✓ to direct ✓ the sound waves along the auditory canal
- OR**
- Extends outside the head/large flaps/funnel shaped ✓ to trap sound waves ✓ (2)

(2)

4.2.3 (i) D ✓

(1)

(ii) A ✓

(1)

(iii) G ✓

(1)

(iv) E ✓

(1)

(v) F ✓

(1)

(11)

Total Question 4: 25

Question 5

5.1

5.1.1 - blood contains proteins/red blood cells/ white blood cells/ blood platelets. ✓✓

OR

- fluid A does not contain proteins/red blood cells/ white blood cells/ blood platelets ✓✓

Mark first 1**(2)**

5.1.2

- pH ✓
- Temperature ✓
- Pressure ✓
- Water ✓
- Mineral salts / examples of ions ✓
- Carbon dioxide ✓
- Nitrogenous waste ✓ (or any example)
- Oxygen ✓
- Hormones ✓
- Dissolved organic food substances (glucose/amino acids) ✓

(4)**Mark first 4**

5.1.3 lymph vessel ✓

(1)

5.1.4

- excess tissue fluid ✓
- will not be drained away to blood ✓
- accumulation of waste ✓ and
- tissue fluid ✓
- leads to swelling of body / leading to oedema
- reduces volume of blood/increases osmotic potential/concentration of blood ✓

any **(3)**
(10)

5.2

5.2.1

- heat transfer ✓ takes place
- from the arterial blood to the venous blood ✓
- hence cooler ✓ blood reaches gill

OR

- reduced temperature gradient between arterial blood and the gills ✓
- thus less heat reaching the gills ✓
- therefore minimal heat loss to the cold water ✓

any **(2)**

- 5.2.2 (i) A ✓ (1)
- (ii)
- Dilated/ wider ✓ blood vessels
 - transports more blood ✓ to skin
 - hence more heat ✓ reaches skin
- any (2)
- 5.2.3
- Functioning of body enzymes ✓
is dependent ✓ on temperature
- OR**
- provides an optimum temperature ✓
for enzyme functioning/metabolism ✓
- OR**
- high temperature ✓ will
denature enzymes ✓
- OR**
- low temperature ✓
will inactivate enzymes ✓
- Mark first 1 (2)**
(7)
- 5.3
- 5.3.1 (i) Hypophysis/pituitary gland ✓ (1)
- (ii) Adrenal glands ✓ (1)
- (iii) Thyroid ✓ (1)
- (iv) Hypophysis/pituitary gland ✓ (1)
- 5.3.2 (i) Gain ✓ (1)
- (ii)
- Thyroxin controls metabolic rate ✓
 - Low metabolic rate ✓ because of low thyroxin concentration
 - Less food oxidised (broken down) ✓
 - Less glycogen converted to glucose ✓
 - Excess food accumulates ✓ as fat
- any (3)
(8)

Total Question 5: 25

TOTAL SECTION B: 100

GRAND TOTAL: 150



SENIOR SERTIFIKAAT-EKSAMEN - 2004

AFDELING A

VRAAG 1

1.1

1.1.1 C ✓✓

1.1.2 C ✓✓

1.1.3 C ✓✓

1.1.4 B ✓✓

1.1.5 C ✓✓

(5 x 2)(10)

1.2

1.2.1 Podosiete ✓

1.2.2 Uitstraling/geleiding/konveksie ✓

1.2.3 Osmose ✓

1.2.4 Negatiewe terugvoer/-koppeling ✓

1.2.5 (Nier)bekken ✓ (woord tussen hakies vereiste in 2005)

1.2.6 Xerofiete/vetplante/sukkulente ✓

1.2.7 Plasmolise ✓

(7)

1.3

1.3.1 E ✓✓

1.3.2 I ✓✓

1.3.3 A ✓✓

1.3.4 C ✓✓

1.3.5 D ✓✓

1.3.6 B ✓✓

(6 x 2)(12)

1.4

1.4.1 Konjunktiva (oogbindvlies/dekvlies) ✓ (1)
(Terme tussen hakkes sal vanaf 2005 nie aanvaar nie)
 (1)

1.4.2 (i) G ✓

(ii) A/F ✓

(iii) D ✓

(iv) E ✓

(v) B ✓(H)

(5)

1.4.3

| F | B |
|------------------|--------------------------|
| is deurskynend ✓ | is nie deurskynend nie ✓ |
| Laat lig deur ✓ | Laat nie lig deur nie ✓ |
| Breek/buig lig ✓ | Breek/buig nie lig nie ✓ |

Enige bypassende verskil

(Merk slegs eerste een)

(2 x 1) (2)

1.4.3 - Retina ✓

- ontvang ligstimulus/verander stimulus na 'n impuls ✓

(2)

(10)

1.5

- 1.5.1 - voeg 'n laag olie op die water by ✓
om die verdamping van water vanaf die silinder te verhoed ✓

OF

- stel 'n kontrole op/aanvaar beskrywing van kontrole (✓)
om die resultate te verifieer/vergelyk (✓) (2)

1.5.2 $\frac{120 - 88 \text{ OF } (32) \checkmark}{120 \checkmark} \times 100 = 26,7 \% / 27\% \checkmark$

OF

$$\frac{32 \checkmark}{120 \checkmark} \times 100 = 26,7 \% / 27 \% \checkmark$$

OF

$$\frac{88 \checkmark}{120} \times 100 = 73,3\%$$

Dus $100\% - 73\% \checkmark = 27\% \checkmark$ (3)

- 1.5.3 (i) Verwyder die blare van die plant/gebruik 'n blaarloose takkie ✓✓

OF

Sit Vaseline/olie op beide kante van die blare ✓✓

OF

Smeer Vaseline/olie op al die dele behalwe die blare ✓✓ (2)

- (ii) bedek die onderste/boonste oppervlaktes van die blare met
Vaseline/olie ✓✓ (2)

- 1.5.4 - houtvate en trageïede is nie-lewende/het lumen/geen selinhoud (✓)
- bestaan uit reeks buisvormige vate/rond (✓)
 - verlengde buise/selle ent aan ent verbind ✓
 - trageïede se eindpunte oorvleuel ✓
 - die wande is verdik/versterk met lignien ✓
 - wande is geperforeer met verskeie stippels ✓
 - klein deursnee van xileemvate ✓
 - dwarswande in xileem is geperforeer/afwesig (✓)
- (Merk slegs eertse twee)**

(2)

(11)

TOTAAL VRAAG 1: 50

TOTAAL AFDELING A: 50

AFDELING B

VRAAG 2

2.1

2.1.1 Endodermis ✓ (1)

2.1.2 - vingeragtig/groot oppervlakarea ✓
 - groot vakuool ✓
 - dun lagie sitoplasma ✓
 - selmembraan/tonoplast is differensieel deurlatend ✓
 - dun selwande ✓
 - selwande is poreues/deurlatend vir water ✓
 - afwesigheid van kutikula ✓ (Merk eerste vier) (4)

2.1.3 - H₂O beweeg van sel tot sel intern langs die selwande ✓
 - en intersellulêre lugruimtes ✓
 - deur diffusie ✓

- H₂O beweeg van sel tot sel/parenchium ✓
 - deur die selmembrane
 - deur die sitoplasma/vakuool ✓
 - deur osmose ✓ (Merk eerste twee roetes) (2 x 3) (6)
 (11)

2.2

2.2.1 14h00 ✓ (1)

2.2.2 - plant B het 'n **dikker** kutikula / plant A het **dunner** kutikula ✓✓
 - plant B het ingesinkte huidmondjies ✓ ✓
 maar nie plant A nie ✓✓
 - plant B het haaragtige strukture (trigome)/plant A het nie trigome nie ✓✓
 - blare van plant B is **kleiner** / plant A se blare is **groter** ✓✓
 - plant B het **minder** huidmondjies/plant A het **meer** huidmondjies ✓✓
 - huidmondjie-openinge van plant B is **kleiner**/ huidmondjies van A is **groter**
 - huidmondjies hoofsaaklik op die **onderste** oppervlak van die blaar in plant B ✓✓
 terwyl plant A huidmondjies op **beide** kante van die blare het ✓✓
 - Blare van B se blare is **dikker**/blare van plant plant a-A **dunner** ✓ ✓
 - Blare van B **meer** epidermis lae/Blare van A het **een** epidermis laag (enige 3 x 2) (6)
 (7)

2.3

- 2.3.1 - fotosintese ✓ vind plaas in die chloroplaste van die sluitselle
- glukose ✓ word geproduseer
- kaliumione ✓ beweeg na die sluitselle
- wat die waterpotensiaal van die sluitselle verlaag (✓)
- water diffundeer van 'n hoë waterpotensiaal (✓)
- in die omringende epidermisselle ✓
- na die sluitselle ✓
- osmose (✓)
- die sluitselle word turgessent ✓
- die dun buitewande van die sluitselle rek na buite ✓
- die dik binnewande trek weg van mekaar en die huidmonjie-porie open ✓ (enige 5) (5)

- 2.3.1 sonlig ✓
CO₂-konsentrasie ✓
Wind ✓
Temperatuur ✓
Humiditeit (✓)
Water
Klimaattoestande (✓) (Aanvaar as 'n alternatief vir bogenoemde)
(Merk eerste twee) (2)
(7)

TOTAAL VRAAG 2: 25

VRAAG 3

3.1

3.1.1 B – proksimale kronkelbuisie ✓
C – boog / dalende been van Henlé ✓
D – versamelbuis /buis van Bellini ✓ (3)

3.1.2 urien ✓ (1)

3.1.3 C ✓ en D ✓ (2)

3.1.4

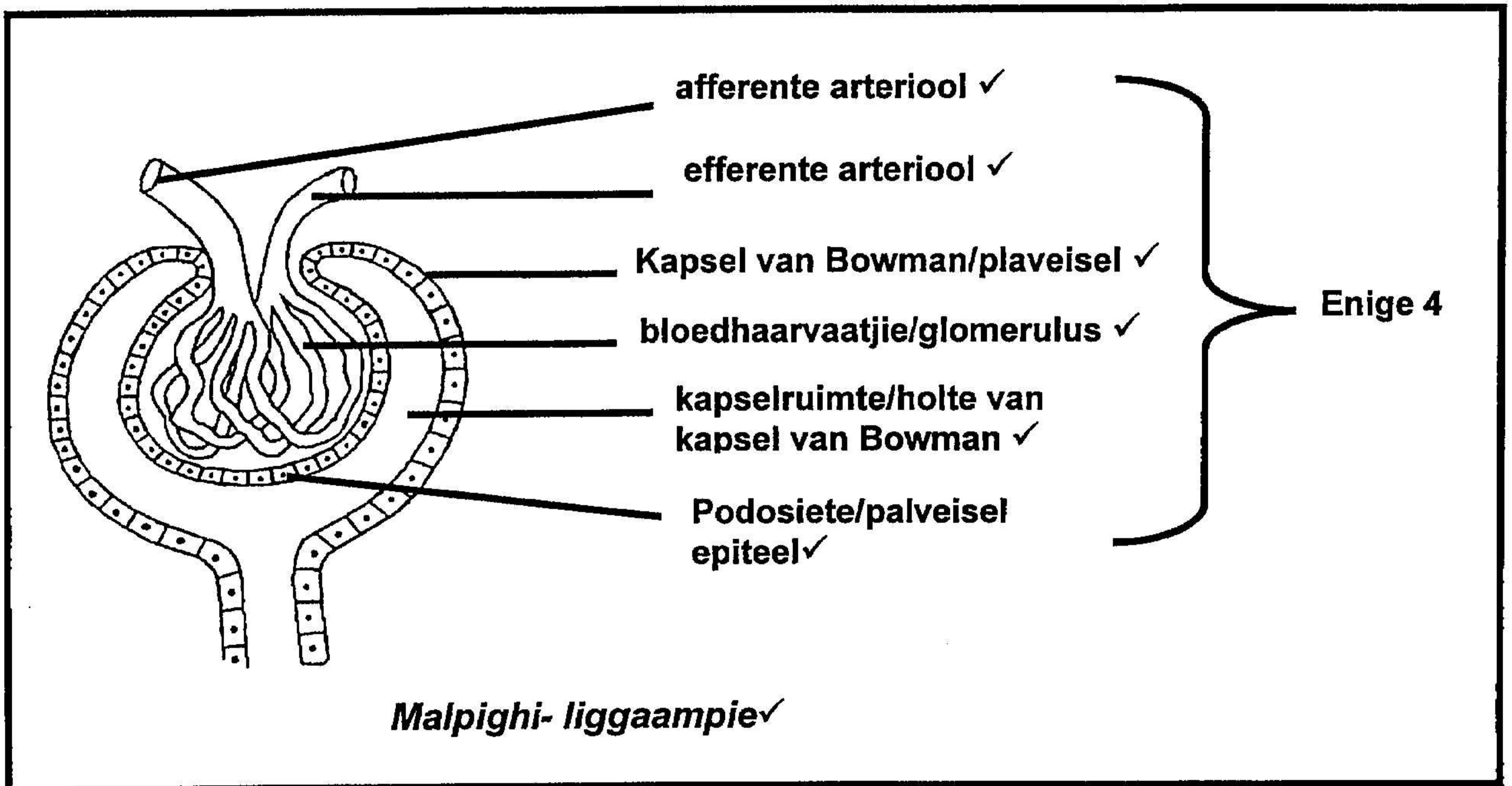


Diagram: Afferent arteriool is wyer as efferente arteriool ✓
'n Koppievormige struktuur ✓
Opskrif: Malpighi-liggaampie ✓
Byskrifte: Enige VIER korrekte byskrifte wat die korrekte struktuur
aandui ✓✓✓✓ (7)

- 3.1.5 - Baie mikrovilli ✓
 om vergroot die oppervlakarea/kontakarea met filtraat ✓
 - baie mitochondria ✓
 om energie te voorsien ✓ vir aktiewe vervoer
 - voue van basaalmembraan (✓)
 om vergroot die oppervlakarea/kontakarea met filtraat ✓ (Merk eerste twee) (4)
(17)
- 3.2
- 3.2.1 **880 000** ✓ arbitrêre eenhede ✓ (2)
- 3.2.2 - glukose word volledig geabsorbeer ✓
 - vanuit die proksimale kronkelbuis ✓
 - daarom word geen glukose uitgeskei nie ✓ (enige 2) (2)
- 3.2.3 Uriensuur ✓
 Kreatinien ✓
 Kreatien ✓
 Ammonium ✓
 Hippuursuur ✓ (enige 2) (2)
- 3.2.4 - diabetes/suikersiekte ✓ mellitus (1)
- 3.2.5 ADH/vasopressien ✓ (1)
(8)

TOTAAL VRAAG 3: 25

VRAAG 4

4.1

- 4.1.1 A – serebrum ✓
 B – serebellum ✓
 C – medulla oblongata (pons) ✓
 D – rugmurg ✓ (4)

- 4.1.2 - vir die geleiding van impulse na / van die brein ✓
 - Dit bevat refleksentrums ✓ (2)

- 4.1.3 refleksboog/neuron/spinal cord/effector/reseptor ✓ (1)

- 4.1.4 - die reseptor ✓ skakel die stimulus om na 'n impuls
 - wat na die sensoriese/afferente neuron/(deur dorsalewortel van rugmurg gelei word) ✓
 - en dan na die inter-/assosiasie-/verbindingsneuron/rugmurg ✓
 - wat impulse na die motor/efferente /(deur die ventrale wortel van rugmurg neuron gelei) ✓
 - die motorneuron vervoer impulse na die effektor/spier ✓ (5)

- 4.1.5 – Om 'n individu in staat te stel om vinnig genoeg te reageer ✓ op 'n stimulus
 - om verdere skade aan weefsels te voorkom ✓ (**Merk eerste voordeel**) (2)
(14)

4.2

- 4.2.1 B - oordrom/tympanum/trommelvlies ✓
 C - malleus/hamer ✓
 D - halfsirkelvormige kanale ✓
 F - koglea ✓ (4)

- 4.2.2 - Het baie riwwe ✓
 om klankgolwe na die gehoorkanaal te gelei ✓

OF

- Steek by die kop uit/groot vlappe/tergter-/keëlvormig ✓
 om klankgolwe op te vang ✓ (2)

- 4.2.3 (i) D ✓ (1)
 (ii) A ✓ (1)
 (iii) G ✓ (1)
 (iv) E ✓ (1)
 (v) F ✓ (1)
(11)

TOTAAL VRAAG 4: 25

VRAAG 5

5.1

5.1.1 - bloed bevat proteïene/rooi bloedselle/ wit bloedselle/ bloedplaatjies. ✓✓

OF

- vloeistof A bevat proteïene/rooi bloedselle/ wit bloedselle/ bloedplaatjies. ✓✓

(Merk eerste een)

(2)

5.1.2 - pH ✓

- Temperatuur ✓

- Water ✓

- Minerale sout /voorbeelde van ione ✓

- Stikstofafval

- Koolstofdioxide) ✓

- Hormones ✓

- Opgeloste organiese voedingstowwe (glukose/aminosure) ✓

- Suurstof ✓

(Merk eerste vier)

(enige 4) (4)

5.1.3 limfvat ✓

(1)

5.1.4 - oortollige weefselvloeistof ✓

- sal nie na die bloed dreineer nie ✓

- ophoping van afvalstowwe en

- weefselvloeistof/lei tot edeem ✓

- lei tot swelling van die liggaam/lei tot edeem ✓

- verminder die volume van die bloed/verhoog osmotiese potensiaal/
konsentrasie van bloed ✓

(enige 3)

(3)

(10)

5.2

5.2.1 - hitte oordrag ✓ vind plaas

- van arteriële bloed na veneuse bloed ✓

- dus koeler ✓ bloed bereik die kieu

OF

- verlaagde temperatuurgradient tussen arteriële bloed en kieu ✓

- dus minder bloed vloei na die kieu ✓

- daarom minimale hitteverlies aan koue water ✓

(enige 2) (2)

- 5.2.2 (i) A ✓ (1)
- (ii) - Wier ✓ bloedvate
- vervoer meer bloed ✓ na die vel
- dus meer hitte ✓ bereik die vel (enige 2) (2)
- 5.2.3 - Funksionering van liggaamensieme ✓
is afhanklik ✓ van temperatuur
OF
- voorsien optimale temperatuur ✓
vir ensiemfunksionering/metabolisme ✓
- OF**
- Hoe temperatuur ✓
denatureer ensieme ✓
- OF**
- Lae temperatuur ✓
stel die ensieme onaktief ✓ (Merk eerste een) (2)
(7)
- 5.3
- 5.3.1 (i) Hipofise/pituïtêre klier ✓ (1)
- (ii) Byniere/adrenaalklier ✓ (1)
- (iii) Skildklier/tiroïedklier ✓ (1)
- (iv) Hypofise/pituitêre klier ✓ (1)

- 5.3.2 (i) Optel ✓ (1)
- (ii) - Tiroksien beheer metabolise tempo ✓
- lae metabolise tempo ✓ vanweë lae tiroksienkonsentrasie
- Minder voedsel word verbrand/geoksideer/afgebreek ✓
- Minder glikogeen na glukose omgesit/afgebreek ✓
- Oortollige voedsel word as vette gestoor ✓ (enige 3) (3)
(8)

TOTAAL VRAAG 5: 25

TOTAAL AFDELING B: 100

GROOTTOTAAL: 150