POSSIBLE ANSWERS FOR:

BIOLOGY SG PAPER 2

SECTION A:

1.1.1 D
1.1.2 D
1.1.3 D
1.1.4 B/C/D
1.1.5 D
1.1.6 C
1.1.7 D
1.1.8 D
1.1.9 A
1.1.10 C

(10X2) = (20)

1.2.1 Xerophytes/succulents/any correct example of a group of xerophytes succulents eg Cacti
1.2.2 Hydathodes
1.2.3 Water potential
1.2.4 Cuticle
1.2.5 Tissue fluid /intercellular fluid/ interstitial fluid
1.2.6 Root pressure/osmotic pressure/turgor pressure
1.2.7 Cornea
1.2.8 Glucagon
1.2.9 Endotherms/ homoiothermic/(warmblooded)
1.2.10 Hibernation/dormancy/winter sleep (10)

1.3.1 D
1.3.2 G
1.3.3 E
1.3.4 A
1.3.5 C

(5X2)=(10)

1.4.1 A The increase in the rate of transpiration (1) is directly proportional to the increase in temperature (1) (2)

B As relative humidity increases (1) the rate of transpiration decreases(1) (2)

C As wind speed increases, there is a increase in transpiration rate (1). Further increase in wind speed causes less increase in transpiration rate (1) (2)

1.4.2 Potometer (2)

1.4.3 Rubber stopper must fit tight/ sealed with vaseline (1) apparatus air tight to prevent the sucking of air into the system(1)

OR

The stem of the leafy twig must be cut under water/stay under water for duration of experiment(1) to prevent air blockage of xylem (1)

OR

Use an active growing young plant (1) so that results are better (1) (2)

OR

Capillary tube must be horizontal(1) to prevent bubble moving to the highest point(1)

OR

Stem must be obliquely (1) to increase surface area (1)

OR

Cut with a sharp knife (1)to prevent damage of xylem(1)

OR

Entire apparatus must be filled with water (1) to prevent interuption in the column of water(1)

OR

Bubble must not be allowed to go beyond tap/reservoir (1) so as not block xylem(1) (any1x2)

SECTION B

QUESTION 2:

2.1.1
1 Nucleus
2 Cell sap/vacuole
3 Soil (particle/ rock/stone)
4 Root hair/cell membrane/ cell wall
5 Xylem/vascular bundle/vessel
6 Cortex/parenchyma cell (6)

2.1.2 In the capillary water or soil water between soil particles is a high water potential /hypotonic solution (1)in the root hair is a low water potential/ hypertonic solution(1). Water move along a water potential gradient(1)
Thus water moves through (end)-osmosis (1), through the cell wall (1), cell membrane (1) cytoplasm (1) tonoplast(1) into the vacuole (1)
(any 5) (5)

2.1.3 Elongated/ fingerlike/large surface area (1),
Thin cell wall (1)
No cuticle (1),
Vacuole filled with hypertonic solution/Vacuole has a low water potential(1)
Large vacuole (1)

(any3) (3)

2.1.4 Endodermal cells/Endodermis (1)

2.1.5 The root hair water potential must be lower (1) than the soil water.(1) (2)
Root hair has a lower water potential (2)/ Soil has a higher water potential (2)

2.1.6 Thin diameter / narrow tubes(1), hollow/dead/large lumen (1) elongated cells (1)
Cell walls strengthened by lignin/ thick walls(1)
Numerous pits /Cell walls are perforated (1)
Cross walls are perforated or absent /
Cells form continuous tubes / cells joined end to end(1)
Roundness of xylem elements (1) gives strength(1)
Tracheids overlap each other(1)

(any 3) (3)

2.2.1 Cell B (1)

2.2.2 Cell B (1)

2.2.3
Cytoplasm shrinks (1),
Vacuole loses water / shrinks/ becomes flaccid (1)
Cell membrane/ protoplasm pulls away from the cell wall(1)
Sugar/salt/ plasmolysing solution/ hypertonic solution/moves into cell through cell wall./ moves into space between cell wall and cell membrane (1) (3)

(any 3)
[25]

QUESTION 3 :

3.1.1 1 Epidermis
2 Sebaceous gland
3 Fat /Adipose tissue (3)

3.1.2. Receptors (heat or cold)(1) detect the change in temperature(1)
Sweat glands/sweat duct/ sweat pore(1) more or less sweat is produced to cool the body (1)
Hair(1) can stand erect or lie down for insulation(1)
Fat cells/Adipose(1) tissue can insulate the body (1)
Blood vessels(1) dilates / constrict depending on temperature (1)
Erector muscle(1) contracts or relax (1) **(3x2)**(6)

3.1.3. Thermoregulation (1) (6)
Excretion (1)
Osmoregulation (1)
Secretion (1)
Sweating (1) **(any 2)** (2)

3.2.1 1 Pituitary gland/Hypophysis/(Master gland)
2 Thyroid
4 Adrenal glands (3)

3.2.2 3 Insulin/Glucagon
4 Adrenalin/ Aldosterone**(any other suitable hormone)** (2)

3.2.3 2
- Control metabolic rate (1)
- Affects growth /development(1)
- Affects blood pressure / dilation of blood vessels (1)
- Affects heart beat (1)
- Increases activity of nervous system / reflex actions/ alertness(1)
- **(any 2)**

4
- Prepares the body for emergencies (1)
- Increases heart beat (1)
- Increases blood pressure (1)
- Increases blood sugar/ Glycogen to glucose (1)
- Increases blood supply to skeletal and cardiac muscles/ Decrease blood supply to digestive system(1)
- Dilate pupils (1)
- Dilate blood vessels to the brain(1)
- Increases muscle tone(1)
- Increases depth of breathing(1)
- Increases resistance to fatigue(1)
- **OR**
- Aldosterone stimulates active reabsorption (1)
- Reabsorption of sodium/activates sodium pump(1)
- From the renal filtrate(1)
- Into the blood (1)
- And the active secretion of potassium from the blood (1)
- Into the filtrate of the distal convoluted tubule(1)
- Involved in the regulation of sodium concentration in the body (1)
- **(any 2)**

3.2.4
- If there is a low thyroxin concentration(1)in the blood the pituitary gland (1) will be stimulated to secrete more TSH (1), which will stimulate the thyroid gland (1) to secrete more thyroxin /normalize thyroxin level in the blood(1) Negative feedback(1)

OR

- If there is a high thyroxin concentration(1)in the blood the pituitary gland (1) will not be stimulated and less TSH will be secreted(1), less thyroxin will be produced /normalize thyroxin level in the blood(1) Negative feedback(1) (5)

[25]

QUESTION 4:

4.1.1 1 Afferent(1) arteriole
2 Efferent(1) arteriole
3 Glomerulus/blood capillary (1)
4 Bowman's Capsule /Lumen (1)
5 Podocytes / Internal wall/ Capsular epithelium/ squamous epithelium(1)
6 Malpighian body/Renal corpuscle(1)

(6)

4.1.2 Afferent arteriole is wider than efferent arteriole (1), which creates a high blood pressure (1),
Thin squamous epithelium in Bowman 's Capsule (1)to allow easy filtration (1)
Close contact between glomerulus and Bowman' s Capsule(1)
Bowman' s Capsule contains podocytes (1) with slit pores(1)acting as a selective filter(1). Thin endothelial blood vessels(1). Increased surface area (1)Bowmans capsule is cup shaped (1) Many capillaries (1)

(any 4)

4.1.3 Glomerular filtration/Ultra filtration/ Filtration(1)

4.1.4
- Glucose (1)
- Amino acids (1)
- Water (1)
- Vitamins (1)
- Urea (1)
- Uric acid (1)
- Creatinine (1)
- Ammonium (1)
- Salts/ ions/ electrolytes (1)
-

(any 3) (3)

4.1.5
- Glucose (1)
- Amino acid (1)
- Water (1)
- Vitamins (1)
- Mineral salts / sodium, chlorine/ potassium / calcium,/ phosphate,/ sulphate (1)
- Electrolytes/ions(1)

(any 3) (3)

4.2 After a large quantity of salts has been taken in, the water potential / water concentration in the blood will be low/ osmotic potential high (1) the pituitary gland (1)
to release more ADH (1),
which will make the distal collecting tubules(1)and collecting ducts(1) more permeable for water (1)
so that more water is reabsorbed into the blood (1)
Less aldosterone secreted(1)
Sodium pump less active(1)
More sodium will stay behind in tubules (1)
More concentrated urine is produced/ more sodium is excreted(1)

(any 5)

4.3 Osmoregulation/ Water balance/ionic regulation / electrolyte regulation (1)
Excretion /Produce urine(1)
Control pH (1)

(any 3)
[25]

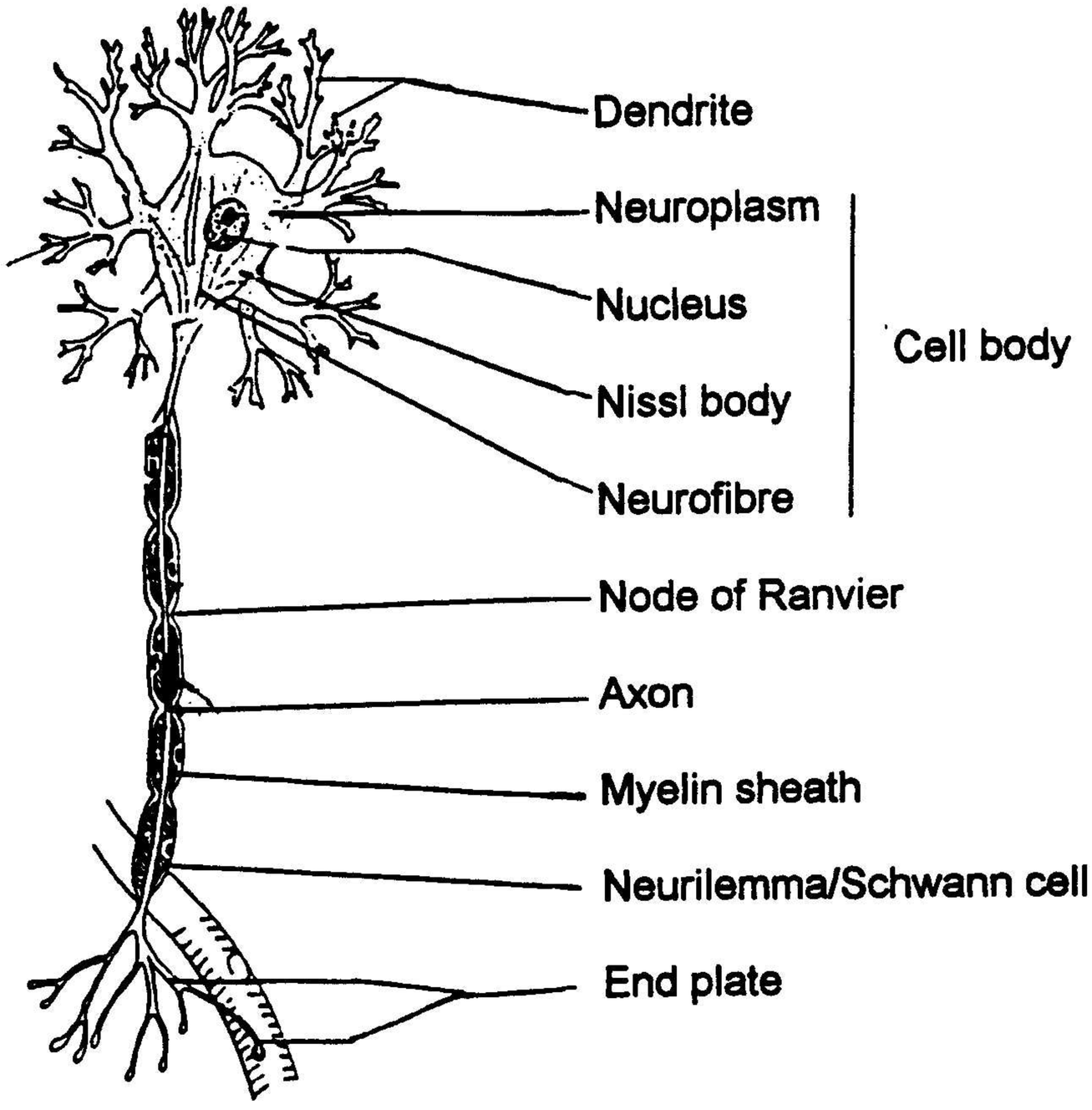
QUESTION 5:

5.1.1 1 Interneuron /Connector neuron /Association neuron/ Multipolar neuron (1)
2 Effector /muscle (1)
3 Skin/Receptor (1)
4 Motor neuron /efferent neuron/ multipolar neuron /axon(1)
5 Sensory neuron / afferent neuron/ bipolar neuron/monopolar/ unipolar neuron /dendrite

(5)

5.1.2 3 → 5 → 1 → 4 → 2 (5)

5.2 Multipolar neuron



SEE NEXT PAGE FOR ALTERNATE LABELS

Additional / amended labels

Neuroplasm/ Cytoplasm (1)
Cell body/ centron (1)
Neurofibril(1)
End plate/ Terminal branches/ Telodendria(1)
Schwann Cell (1)
Neurilemma (1)

(any 5+1 correctness=6)

5.3.1
1 Fissures/grooves/ folds/ Cerebrum/Frontal lobe/ Fore brain
2 Medulla oblongata
3 Spinal cord
4 Cerebellum

(5)

5.3.2
- Seat of consciousness(1)
- Control voluntary actions(1)
- Seat of higher intellectual activities like memory,/ reasoning/, judgement (1)
- Contain centre's for vision/ hearing/ taste/.smell/ all sensation arise here (1)
- Temperature regulation(1)
- Reflexes/ examples(1)
- Balance/ muscle tone/ muscular coordination (1)
- Emotions (1)
- Blood pressure (1)

(any 4)

5.3.3 Meninges/ any named meninges (1), skull / cranium(1), cerebrospinal fluid (1), hair (1)
(any 1)

[25]

TOTAL: 150

MOONTLIKE ANTWOORDE VIR

BIOLOGIE SG VRAESTEL 2

BIOLOGIE SG

AFDELING A:

1.1	1.1.1	D		
	1.1.2	D		
	1.1.3	D		
	1.1.4	B/C/D		
	1.1.5	D		
	1.1.6	C		
	1.1.7	D		
	1.1.8	D		
	1.1.9	A		
	1.1.10	C	(10 × 2)	(20)
1.2	1.2.1	Xerofiete / Sukkulente / Vetplante/ enige korrekte voorbeeld van 'n groep bv Kaktusse		
	1.2.2	Hidatodes		
	1.2.3	Waterpotensiaal		
	1.2.4	Kutikula/washuid		
	1.2.5	Weefselvloeistof/ intersellulere vloeistof/bloedplasma		
	1.2.6	Worteldruk/osmotiese druk/turgordruk		
	1.2.7	Kornea		
	1.2.8	Glukagon		
	1.2.9	Endotermiese diere /homoiotermies (warmbloedig)		(10)
	1.2.10	Hiberneer/dormansie		
1.3	1.3.1	D		
	1.3.2	G		
	1.3.3	E		
	1.3.4	A		
	1.3.5	C	(5 × 2)	(10)

1.4 1.4.1

A Die toename in transpirasie snelheid (1) is direk eweredig aan die toename in temperatuur (1) (2)

B Soos die relatiewe humiditeit toeneem (1) neem die transpirasietempo af (1) (2)

C Soos die windspoed toeneem is daar 'n toename in die tempo van transpirasie (1) as die windspoed toeneem tot by sy optimum is daar 'n kleiner toename in die tempo van transpirasie (1) (2)

1.4.2 Potometer (2)

1.4.3 Rubber prop moet stewig pas /verseel met vaselinel (1)apparaaat moet lugdig wees om te verhoed dat lug ingesuig word in die sisteem (1)

OF

Die stingel moet onder water afgesny word/bly onder water vir die duur van die eksperiment (1) om te verhoed dat lug die xileem blokkeer (1)

OF

Gebruik 'n jong aktief groeiende plant (1) vir beter resultate (1)

OF

Kapillêre buis moet horisontaal wees (1) om te verhoed dat die lugborrel na hoogste vlak beweeg. (1)

OF.

Die lugborrel moet nie toegelaat word om verder as die kraantjie of reservoir te gaan nie (1) sodat die xileem nie blokkeer nie.

OF

Sny die stingel skuins(1) vir vergrote oppervlakte(1)

OF

Sny die stingel met 'n skerp mes(1) om weefselskade te voorkom(1)

OF

Die hele apparaat moet met water gevul word(1) om die onderbreking van die waterkolom te voorkom (1)

(enige 2) (2)

[50]

AFDELING B

VRAAG 2:

2.1 2.1.1

1 Nukleus / selkernl
2 Selsap / vakuool
3 Grond (partikels/rotsdeeltjies)
4 Selmembraan/selwand/wortelhaar
5 Xileem / vaatbundel / houtvat
6 Korteks/parenchiem(sel) (6)

2.1.2 In die kapillêre water/grondwater tussen die gronddeeltjies is 'n hoë waterpotensiaal/hipotonies oplossing (1)/water beweeg langs 'n waterpotensiaalgradient (1)
In die wortelhare is 'n lae water potensiaal /hipertonies(1)
water beweeg deur (end)osmose (1)
deur die selwand (1) selmembraan(1) tonoplas(1) sitoplasma(1)
in die vakuool in (1) **(enige 5)** (5)

2.1.3 Verlengde (1), vingeragtige (1)
dunwandig (1)
Geen kutikula (1)
Groot vakuool(1)
Vakuool gevul met hipertoniese oplossing / vakuool het 'n lae waterpotensiaal (1) **(enige 3)** (3)

2.1.4 Endodermale sel/endodermis (1)

2.1.5 Die wortelhaar se waterpotensiaal moet laer wees(2)/grondwater het 'n hoër waterpotensiaal (2) (2)

2.1.6 Dun/ klein deursnee (1), hol / dood /(1), verlengde(selle) (1)
Selwande versterk met lignien/dik wande(1)
Verskeie stippels/selwande geperforeer(1)
Dwarswande is geperforeer of afwesig/ die selle vorm aaneenlopende buise/ selle punt aan punt geskakel(1)
Rondheid van xileemelemente (1)gee sterkte (1)
Trageiede oorvleuel mekaar (1) **(enige 3)** (3)

2.2.1 Sel B (1)

2.2.2 Sel B (1)

2.2.3 Selmembraan/protoplasma trek weg vanaf selwand (1)
Sitoplasma krimp/word slap(pap)(1)
Vakuool verklein/verloor water (1)
Suikeroplossings/soutoplossing/plasmoliseringsvloeistof/hipertoniese oplossing beweeg die sel binne deur die selwand/beweeg na spasie tussen selwand en selmembraan(1) (3)
(enige3) **[25]**

VRAAG 3 :

3.1 3.1.1 1 Epidermis/opperhuid
2 Vetklier
3 Vet/vetweefsel (3)

3.1.2 Hitte/koueresептors (1) neem temperatuur veranderinge waar (1)
Sweetklier (1) meer of minder sweet word geproduseer om die liggaam af te koel (1)
Hare (1) kan regopstaan/plat lê vir insulasie (1)
Vetselle/vetweefsel (1) Insuleer liggaam teen koue (1)
Erektorspiere(1) trek saam of verslap(1)
Bloedvate (1)verwyd/vernou afhangende van temperatuur (1)
(enige 3x2) (6)

3.1.3 Termoregulering (1)
Ekskresie (1)
Osmoregulering (1)
Sekresie (1)
Sweet (1) **(enige 2)** (2)

3.2.1 1 Hipofise /pituitêre –(meesterklier)
2 Skildklier / tiroied
4 Byniere / adrenaalkliere (3)

3.2.2 3 Insulien/Glukagon
4 Adrenalien/aldosteroon **(enige ander aanvaarbare hormoon)** (2)

3.2.3 2 - Beheer metaboliese tempo (1)
-Beinvloed groei/ontwikkeling(1)
-Beïnvloed hartklop (1)
-Beïnvloed bloeddruk /verwyding van bloedvate(1)
-Verhoog aktiwiteite van senuweestelsel/refeksaksies/wakkerheid(1)
(enige 2) (2)

4- - Berei die liggaam voor vir noodtoestande (1)
- Versnel hartklop (1)
- Verhoog bloeddruk (1)
- Verhoog bloedsuikervlak/glikogeen na glukose (1)
- Verwyd pupille (1)
- Verhoog bloedvloei na skeletspiere en hartspiere / verminder bloedvloei na spysverteringstelsel(1)
- Laat hare regop staan
- Verwyd bloedvate na die brein
- Verhoog spiertonus
- Haal dieper asem

OF

- Aldosteroon stimuleer aktiewe herabsorbsie (1) van Natrium/natriumpomp
- word geaktiveer. (1) vanaf die filtraat (1) na die bloed (1) en die aktiewe sekresie van kalium van die bloed na die filtraat in die distale kronkelbuis (1)
- Regulering van natriumkonsentrasie (1)

3.2.4 As daar 'n lae tiroksien konsentrasie (1)in die bloed is, sal die hipofiese(1) gestimuleer word om meer TSH(1) af te skei wat die skildklier(1) stimuleer om meer tiroksien(1) af te skei
Negatiewe terugkoppeling (1)

OF

As daar 'n hoë tiroksienkonsentrasie (1) in diebloed is sal die hipofise gestimuleer word om minder TSH (1) af te skei wat die skildklier (1) stimuleer om minder tiroksien (1) in die bloed af te skei (1). Negatiewe terugkoppeling (1)
(enige 5) (5)

VRAAG 4:

4.1.1 1 Afferente(1) arteriool / toevoerende slagaartjie
2 Efferente(1) arteriool / afvoerende slagaartjie
3 Glomerulus/bloed kappillêre (1)
4 Kapsel van Bowman / lumen / kapselruimte (1)
5 Podosiete / binnewand /kapselepiteel/plaveiselepiteel(1)
6 Liggaampie van Malpighi / nierliggaampie (1) (6)

4.1.2 Afferente arteriool is wyer as die efferente arteriool (1),
veroorsaak hoë druk in glomerulus (1),
Die dun plaveiselepiteel van die kapsel van Bowman (1) laat maklike filtrasie toe (1)
Noue kontak tussen glomerulus en kapsel van Bowman (1)
Kapsel van Bowman is koppievormig (1)bevat podosiete (1) met spleetopeninge wat as 'n selektiewe filter dien(1)
Dun endoteel bloedhaarvaatjies (1)
Vergrote oppervlakte (1)
Baie bloedhaarvaatjies (1)

(enige 4) (4)

4.1.3 Glomerulêre filtrasie /Ultra – filtrasie/filtrasie (1)

4.1.4
- Glukose (1)
- Aminosure (1)
- Water (1)
- Vitamiene (1)
- Mineraalsoute (1)
- Ureum (1)
- Uriensuur (1)
- Kreatinien (1)
- Ammonium (1)
- Waterstofione(1)
- Soute/elektroliete/ione(1)

(enige 6) (6)

4.1.5 Glukose(1)
Aminosure (1)
Water (1)
Vitamiene (1)
Minerale soute/voorbeelde (1)
Elekktroliete/ione (1)

4.2 Nadat 'n groot hoeveelheid soute geneem is, is die waterpotensiaal/waterkonsentrasie laag/ smotiese potensiaal is hoog(1) in die Die pituitere klier (1)
stel meer ADH vrystel (1)
wat die distale kronkelbuise en versamelbuise(1)
meer deurlaatbaar maak vir water (1)
sodat meer water geherabsorbeer word na die bloed (1)
Minder aldosteroon word afgeskei(1)
Natriumpomp word minder aktief(1)
Meer natrium sal in die buisies agterbly(1)
Meer gekondsentreerde urine word geproduseer(1)
Meer natriumione word uitgeske (1) (5)
(enige 5)

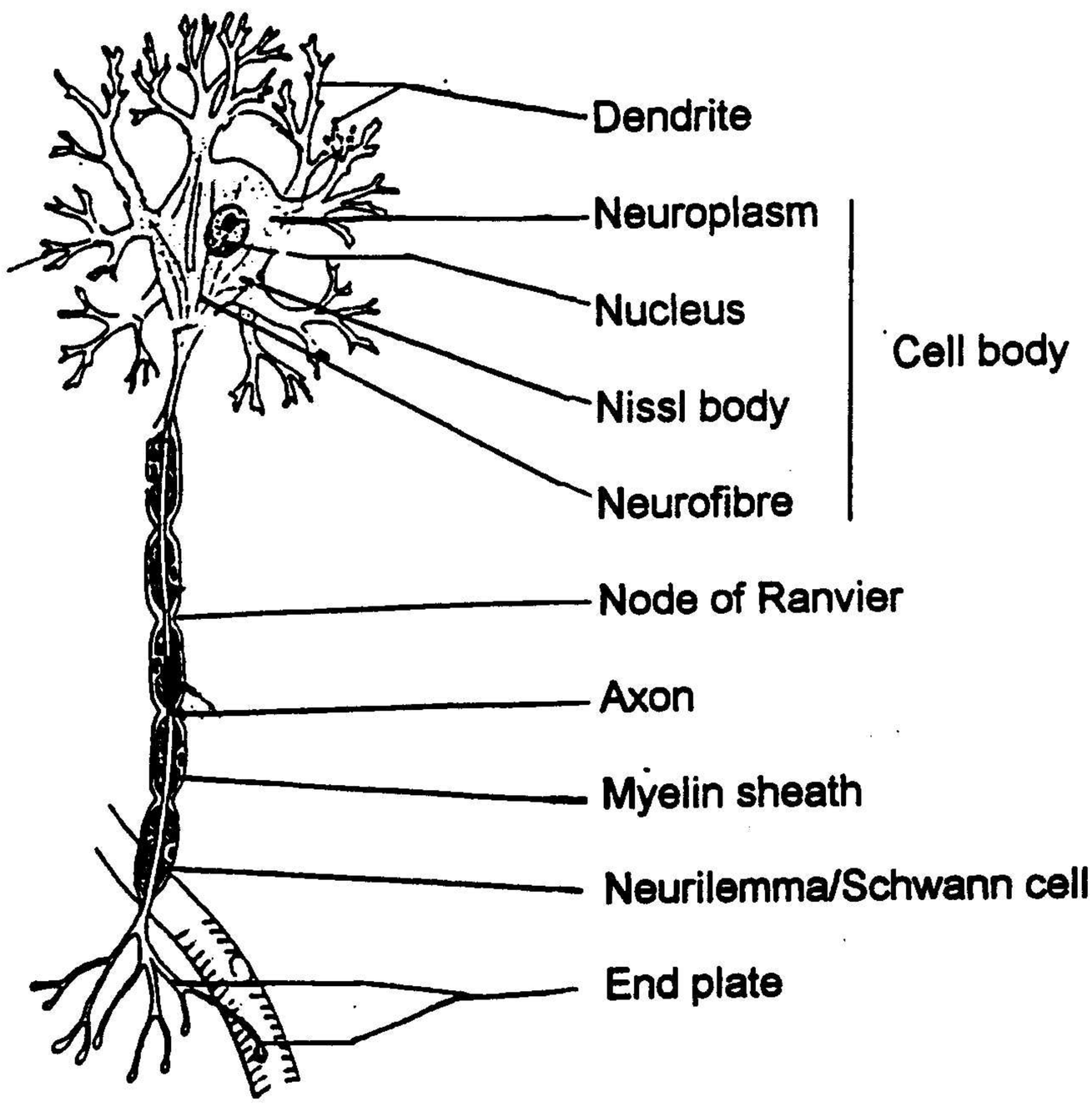
4.3 Osmoregulering/waterbalans/ioniese of elektrolitiese regulering (1)
Eksresie/ produseer urine (1)
Beheer pH (1) **(enige 3)** (3)

VRAAG 5:

5.1.1 1 Interneuron/verbindingsneuron/assosiasie neuron/multipolere neuron (1)
2 Effektor/spier (1)
3 Vel/reseptor (1)
4 Motoriese neuron / Efferente neuron/Multipolere neuron/akson (1)
5 Sensoriese neuron / Afferente neuron/ Unipolere/bipolêr neuron/dendriet (1)

5.1.2 3→ 5 → 1→ 4→ 2 (5)

5.2 Multipolere neuron



Blaai asseblief om

Ekstra byskrifte

Neuroplasma /Sitoplasma (1)
Selliggaam / sentron (1)
Neurofibril (1)
Endplaat/Eindvertakkings/Telodendria (1)
Schwann sel (1)
Neurilemma (1) **(enige 5 + 1 korrekheid)** **(6)**

5.3.1 1 Groewe / voue/ serebrum/grootbrein/ groot harsings/voorbrein
2 Medulla oblongata/ verlengde rugmurg
3 Rugmurg
4 Cerebellum/kleinbrein/klein harsings (4)

5.3.2
- Setel van bewussyn (1)
- Beheer willekeurige handelinge (1)
- Setel vir hoër intelektuele aktiwiteite soos oordeel/ redeneer/geheue
- Bevat sentrums vir sig/gehoor,/smaak/ reuk (1)
- Alle sensasies ontstaan hier (1)
- Bloeddruk (1)
- Balans/spiertonus
- Emosies
- Temperatuur regulering
- Reflekse/voorbeelde **(enige 4) (4)**
-

5.3.3
- Meninges/breinvliese (1)
- Skedel/kranium (1)
- Serebrospinale vloeistof (1) **(enige 1)** (1)
- Hare (1)

TOTAAL: 150