GAUTENG DEPARTMENT OF EDUCATION
SENIOR CERTIFICATE EXAMINATION

PHYSIOLOGY SG

POSSIBLE ANSWERS OCT / NOV 2006

SECTION A

QUESTION 1

1.1	C
1.2	A
1.3	D
1.4	C
1.5	A
1.6	D
1.7	A
1.8	A
1.9	A
1.10	C
1.11	A
1.12	C
1.13	A
1.14	D
1.15	B
1.16	D
1.17	C
1.18	A
1.19	B
1.20	C
1.21	C
1.22	D
1.23	B
1.24	B
1.25	C
1.26	B
1.27	D
1.28	B
1.29	A
1.30	A

30x2=**[60]**

QUESTION 2

2.1 K
2.2 J
2.3 I
2.4 F
2.5 A
2.6 E
2.7 G
2.8 O
2.9 N
2.10 L **[10]**

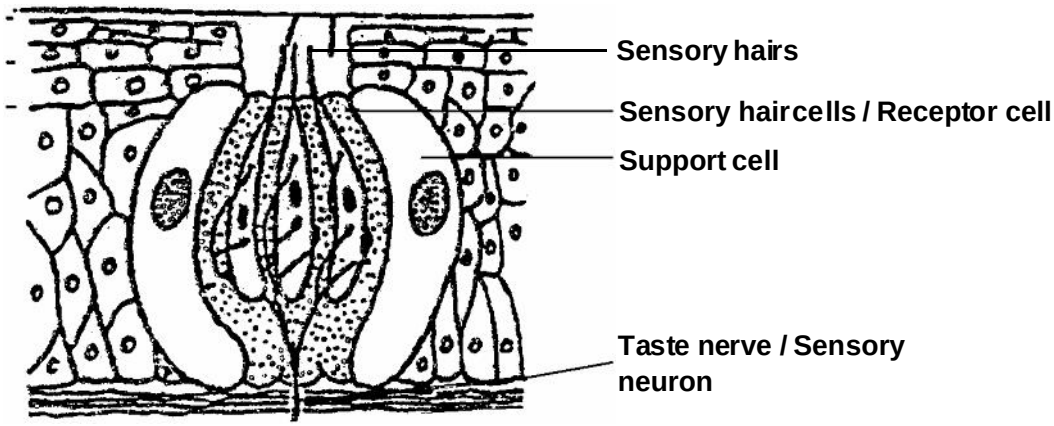
QUESTION 3

3.1 Urea
3.2 Renal capsule
3.3 Distal convoluted tubule
3.4 Renal vein
3.5 Melanin
3.6 Malpighian layer
3.7 Homeostasis
3.8 Receptors
3.9 Lymph
3.10 Perimetrium
3.11 Prostate gland
3.12 Umbilical cord
3.13 Sertoli cells
3.14 Islets of Langerhans
3.15 Menstruation **[15]**

QUESTION 4

4.1 Renal capsule
4.2 Papilla/ calyx
4.3 Cortex
4.4 Medulla
4.5 Collecting ducts/piramid
4.6 Interlobular artery
4.7 Renal vein
4.8 Renal artery
4.9 Pelvis
4.10 Ureter (10)

4.2 **A Tastebud** P



4.2 - heading (1)
- labels (3)
- diagram (1)
[15]

TOTAL FOR SECTION A: [100]

SECTION B

QUESTION 5

5.1
5.1.1 TSH / thyroid stimulating hormone PP (2)
5.1.2 Calcitonin PP (2)
5.1.3 Functions: Increases tempo of metabolism/ tempo of respiration
Enhances normal functioning of heart
Enhances the function of the nervous system (3)
5.14 Iodine P (1)
5.15 (a) Cretinism
(b) Myxoedoema (2)
5.16 (a) STH/ somatotrophic hormone P (1)
(b) Skeleton P long bones, muscles P (2)
(c) Acromegali PP (2)
(d) Enlargement of jaws P, hands P orbita P (3)

5.2
5.2.1 a. Andenohypophysis/ anterior lobe
b. prolactin
c. stimulates the production of milk
d. Neurohypophysis/ posterior lobe
e. Oxytocin
f. Stimulates the flow of milk from the breasts during lactation (6)
5.2.2 FSH P: Stimulates the growth and development of the Graafian follicle P
LHP: Stimulates ovulation/ release of ovum P and the development of the Corpus Luteum P (5)

5.3

5.3.1 Interstitial cells P (1)

5.3.2 Testosterone PP (2)

5.3.3 Beard P, voice breaks P, muscles develop P hair in the armpits & pubic area P, more red blood cells P, skin thickens P, spermatozoa starts to develop P (any 5) (5)

5.4

5.4.1
a. Sebum gland / oil gland
b. Sebum / oil
c. Lubricates skin / keeps it subtle
d. Cerumen gland / wax gland
e. Cerumen / ear wax
f. Prevent insects from crawling in / keeps ear clean and moist / slow growth of bacteria down
g. Sweat gland
h. Sweat
i. Cooling of body / excretion / osmoregulation (9)

5.4.2 Produces melanin P that protects P skin against UV rays from the sun P
Produces vitamin D P
Sense organ P
Protects body against penetration of germs P (4)

[50]

QUESTION 6

6.1

6.1.1
1. Ciliary body
2. Suspensory ligaments
3. Lens
4. Pupil
5. Cornea
6. Iris
7. Conjunctiva
8. Sclera
9. Choroïd
10. Retina (10)

6.1.2 The radial muscles relax P the circular muscles contract P and the pupil constricts P so that less light can enter the eye P to protect the retinaP against the UV raysP (5)

6.1.3 No. 5: Cornea is transparent P to enable light to enter eyeP
No. 8: Sclera is non-transparentP and non-elastic to give shape to eye.P (4)

6.1.4 No. 13 to the occipital lobe PP (2)

6.1.5
(a) Cones (1)
(b) Rods and cones (1)
(c) For night vision / distinguish between light and dark (1)
(d) Vitamin A (1)

6.2

6.2.1 No. 3P: Tympanum/ ear drum P
No. 4P: Oval window P
No. 5P: Round window P (6)

6.2.2 (a) Malleus/hamer P, Incus/anvil P, Stapes/stirrupP (3)

(b) Ossicles PP (2)

6.2.3 1: Pinna P: Receive sound waves and conduct them into external canal P
10: Eustachian tube P; Maintain equal pressure on both sides of tympanumP (4)

6.2.4 PerilymphP and endolymphP (2)

6.2.5 The tympanum can ruptureP preventing soundwaves to be converted into vibrations PP cannot be conducted to ossiclesP (2)

6.2.6 (a) To the cerebellum P (1)

(b) To the temporal lobe P / auditory area (1)

6.2.7 (a) No. 9: Cochlea P (1)

(b) Organ of Corti P (1)

(c) Convert sound waves / vibrations P into an impulse P (2)

[50]

QUESTION 7

7.1

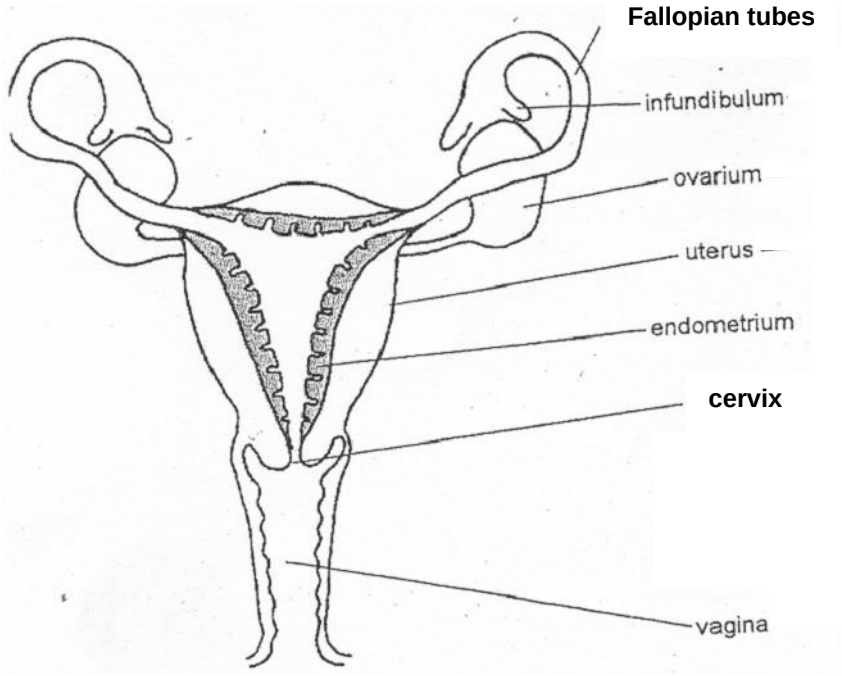
7.1.1 1. Bladder
2. Penis
3. Uretra
4. Ureter
5. Seminal vesicles
6. Prostate gland
7. Cowper's gland
8. Epididymus
9. Vas deferens / spermduct
10. Testis
11. Scrotum (11)

7.1.2 Numbers 1 P. 3 P, 4 P (3)

7.1.3 (a) 5: Seminal Vesicles
6: Prostate gland
7: Cowper's gland (3)

(b) Fructose –provide energy to the spermP
Alcaline mucusP – neutralize acid in the vagina or urethraP
Enzymes – improve mobility of sperm
Prostaglandines – liquefy mucus in vagina/ reverse peristalsis in Vagina
Antibiotics – protect sperm against bacteria Any 3x2 (6)

7.1.4 SKETCH OF FEMALE REPRODUCTIVE SYSTEM:
HEADING 1
SKETCH 1
LABELS 5



(7)

7.1.5 (a) Urethra
(b) Endometrium
(c) Penis
(d) Testes
(e) Corpus Luteum (5)

7.2
7.2.1 Convection, conduction, evaporation, radiation (4)
7.2.2 Evaporation P (1)
7.2.3 (a) Krause corpuscles (1)
(b) 37°C (1)
(c) Vasoconstriction takes place / blood vessels in skin constrict more blood to deeper regions of skinP
Erector musclesP contract, hair stands erectP/goose bumbs
Air trappedP between hair, act as insulation P/ no heat loss
Less blood to skin means less sweat production P, Less evaporationP
ShiverP, muscle tone increasesP (Any 8) (8)
[50]

QUESTION 8

8.1
6. Central canal
7. Cerebrum
8. Pons of Varol
9. Cerebellum
10. Medulla Oblongata (5)

8.2 8.2.1
3 Dura mater
4 Arachnoïed mater
5 Pia mater (3)

8.2.2
1. Skull
2. Vertebra (2)

8.2.3
(a) Subarachnoid cavity P filled with cerebrospinal fluidP (2)
(b) Acts as shock absorber P.
Maintains constant pressure around (central nervous system) CNSP
Provides nutrients and oxygen to CNSPP
Removes metabolic waste and carbon dioxide from CNS P
Prevents dehydration of the brain P (5)
(c) Number 6 PP (2)

8.3 8.3.1 Receptor converts stimulus into impulseP sensory neuronP conducts impulse through mixed nerveP to the posterior rootP to the ganglionP to the cell bodyP. Into the posterior hornP over a synapseP to the interneuronP over a synapse to the motor neuronP/ multipolar neuron into the anterior hornP and rootP through the mixed nerve to the effectorP and a reaction will take place.
(Any 8) (8)

8.3.2
(a) A reflex action is much faster than a normal reaction as it is interpreted in the reflex centre in the spinal cordP and not the brainP (2)
(b) to protect the body from harm PP (2)
(c) sneeze, blink, cough, knee reflex (Any 2) (2)

8.4
8.4.1
1. Afferent arteriole
2. Efferent arteriole
3. Malpighian body
4. Proximal convoluted tubule
5. Loop of Henlé
6. Distal convulated tubule
7. Collecting duct (7)

8.4.2 Number 1 is narrower than no. 2P to exert a high hydrostatic pressure in the glomerulusP (2)

8.4.3 Sodium pumpP / sodium pumped out (1)

8.4.4 (a) No 3: filtrate
No. 7: Urine (2)

(b) glucose, amino acids, (2)

8.4.5 Blood cells/ red blood cells/ white blood cellsP and proteinsP as they are to big to pass throughP macro moleculesP (3)

[50]

TOTAL FOR SECTION B: [200]

TOTAL: 300