### SECTION A

#### QUESTION 1

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1.1.20  B
1.1.21  A
1.1.22  C
1.1.23  B
1.1.24  C
1.1.25  B

1.2  1.2.1  Corpus luteum
1.2.2  Synapse
1.2.3  Renal artery
1.2.4  Pituitary gland (Hypophysis)
1.2.5  Sweat gland
1.2.6  Sclera
1.2.7  Renal capsule
1.2.8  Oxytocin
1.2.9  Melanin
1.2.10  Central nervous system
1.2.11  Sebum
1.2.12  Diabetes mellitus
1.2.13  Thermoregulation
1.2.14  Organ of Corti
1.2.15  Evaporation
1.2.16  Placenta
1.2.17  ADH (Anti-diuretic Hormone)
1.2.18 Cerebrospinal fluid
1.2.19 Circumvallate
1.2.20 Hormones

1.3 1.3.1 Ureter
1.3.2 Bladder
1.3.3 Urethra
1.3.4 Frontal lobe
1.3.5 Parietal lobe
1.3.6 Occipital lobe
1.3.7 Temporal lobe
1.3.8 Bitter
1.3.9 Sour
1.3.10 Salty
1.3.11 Sweet
1.3.12 Adrenal gland
1.3.13 Zona pellucida/Jelly-like film
1.3.14 Nucleus
1.3.15 Follicle cells

TOTAL SECTION A: 100
SECTION B

QUESTION 2

2.1

afferent arteriole

glomerulus (capillary network)
podocytes (forming inner layer of Bowman's capsule)
efferent arteriole

Bowman's capsule cavity

squamous epithelial cell

2 X Correct Drawing
1 x Correct Heading
7 x Correct labels

A renal corpuscle/Malpighian body

2.2 - Glucose: Lack of insulin (Diabetes Mellitus) OR
Recent intake of a high carbohydrate meal
- Protein: Glomerular membrane is damaged by injury or disease of the kidneys
- Blood: An infection, injury, bilharzia or very strenuous exercise
- Bile pigments: Due to a blockage of bile ducts during an infection of the liver (jaundice)
- Kidney stones: Insufficient intake of water OR Stagnation of urine due to a blocked tube
- Ketones/Acetones: Due to Diabetes Mellitus OR A lack of glucose
(Any 5) (10)

2.3 2.3.1 Cold day. (1)

2.3.2 Traps a layer of air that acts as an insulator. (1)

2.3.3 a) Decreases sweat secretion.
b) Circular muscles contract to cause constriction of blood capillaries.
c) Rapid contraction of voluntary muscles – Shivering. (3x2)(6)

2.4 2.4.1 Reflex arc (1)

2.4.2 1 – Receptor
2 – Sensory neuron
3 – Connector / Interneuron
4 – Motor neuron
5 – Effector (5)
2.4.3 1 – Respond to external stimuli and generates an impulse to be sent to dendrites of sensory neurons.
2 – Carries impulse to central nervous system and makes synaptic contact with the connector neuron.
3 – Represents the reflex centre and makes synaptic contact with the motor neuron in grey matter of spinal cord.
4 – Carries impulse from connector neuron to effector.
5 – Responds to impulses and brings about an appropriate action. (5)

2.5 2.5.1 A – Testis    B – Seminiferous tubule

2.5.2 1 – Connective tissue capsule
2 – Seminiferous tubules
3 – Straight tubules
4 – Rete testis
5 – Epididymis
6 – Spermatozoa/Sperm cells

2.5.3 Spermatozoa/Sperm cells

2.5.4 Scrotum

2.5.5 The testis produce spermatozoa at a lower temperature than that of the body. (1)

QUESTION 3

3.1 - Glomerular filtration
- Tubular reabsorption
- Tubular secretion / excretion

3.2 - Control of nitrogenous waste products.
- Osmoregulation.
- Control of sodium ions.
- Regulation of pH-balance.

3.3 3.3.1 Sweat gland

3.3.2 A – Epidermis    B – Dermis

3.3.3 1 – Sweat pore
2 – Duct of sweat pore
3 – Nerve
4 – Sweat gland
5 – Blood capillaries
3.3.4 - A rise in air temperature.
- Lowering of humidity of the atmosphere.
- Large intake of fluids.
- Exercise.
- Nausea.
- Excitement.
- Disease.
- Spicy food. \( \text{(Any 3)} \) \( \text{(3)} \)

3.3.5 - Cold ambient temperature.
- Increased urine production.
- Certain chemical substances, e.g. atropine.
- Dehydration. \( \text{(Any 3)} \) \( \text{(3)} \)

3.4 3.4.1 A – Myopia (Near/Short sighted)
B – Hypermetropia (Long sighted)
C – Presbyopia \( \text{(3)} \)

3.4.2 - Lens too convex.
- Cornea too convex.
- Eyeball too elongated. \( \text{(3)} \)

3.4.3 By wearing glasses or contact lenses with suitable convex lenses to converge the light rays more so that they meet to form an image on the retina and not behind it. \( \text{(2)} \)

3.4.4 Vertical and horizontal lines are not seen with the same clarity. \( \text{(2)} \)

3.4.5 - Image appears distorted.
- Eyestrain and headaches may occur. \( \text{(2)} \)

3.5 3.5.1 1 – Pituitary gland (Hypophysis)
2 – Thyroid gland
3 – Pancreas (Islets of Langerhans)
4 – Adrenal gland \( \text{(4)} \)

3.5.2 - Adenohypophysis/Anterior lobe
- Neurohypophysis/Posterior lobe \( \text{(2)} \)

3.5.3 Thyroxine \( \text{(1)} \)

3.5.4 TSH (Thyroid Stimulating Hormone) \( \text{(1)} \)

3.5.5 Pancreas (Islets of Langerhans) \( \text{(1)} \)

3.5.6 Parathyroid \( \text{(1)} \) \( \text{[50]} \)
QUESTION 4

4.1 - Tough renal capsule protects against physical injury and the spread of infections.  
- Adipose tissue protects against physical injury.  
- Outer fibrous connective tissue anchors the kidney to prevent displacement by body movements.  
- Partially well protected by the lower ribs.  
- Strong back muscles form an outer protective layer.

4.2 - Radiation: Heat energy is transferred from a warm body to a colder environment.  
- Conduction: Transfer of heat energy from hotter to colder objects which are in contact with each other.  
- Convection: Air warmed by the body rises and is replaced by cooler air.  
- Evaporation: Change of a liquid to a gas (vapour). Water evaporates from the body surface and the necessary energy is absorbed from the body tissue.

4.3 4.3.1 1 – Synaptic knob  
2 – Mitochondrion  
3 – Synaptic vessel  
4 – Pre-synaptic membrane  
5 – Post-synaptic membrane

4.3.2 From A to B.

4.3.3 A – Synaptic knob  
B – Dendrite

4.3.4 Acetylcholine

4.3.5 Provides the energy for the transfer of impulses.

4.5.6 It insulates the nerve fibre ensuring that impulses can travel at high speeds.

4.4 1 – External auditory passage  
2 – Tympanic membrane  
3 – Ossicles  
4 – Oval window  
5 – Round window  
6 – Air chamber/Middle ear  
7 – Eustachian tube

4.5 4.5.1 Adrenaline.

4.5.2 To prepare the body for action in order to cope with an emergency.

4.5.3 Sympathetic nervous system
4.5.4 - Increased blood pressure  
- Increased blood sugar levels  
- Oxygen content of blood is raised  
- Heart rate is increased  
- Skeletal muscle-tone is increased  
- Dilation of pupils  
- Increased sweating  
- Reduction of digestive system activity  
- Increased mental alertness  

(Any 4)  

4.6 - Gonorrhoea  
- Syphilis  
- Genital herpes  
- Genital warts  
- HIV/Aids  

(5)  

[50]  

QUESTION 5  

5.1  
5.1.1 1 – Pituitary gland (Hypophysis)  
2 – Cerebellum  
3 – Medulla oblongata  
4 – Spinal cord  

(4)  

5.1.2 A – Fissure of Rolando  
B – Fissure of Sylvius  

(2)  

5.1.3 - Co-ordination actions of voluntary muscles.  
- Helps maintain balance and equilibrium.  
- Controls muscle tone and posture.  

(Any 2)  

(2x2)(4)  

5.2  
5.2.1 1 – Free nerve endings  
2 – Meissner’s corpuscles  
3 – Ruffini’s corpuscles  
4 – Krause’s corpuscles  
5 – Pacinian corpuscles  

(5)  

5.2.2 1 – Pain  
2 – Light touch  
3 – Heat  
4 – Cold  
5 – Pressure  

(5)
5.3 5.3.1 An undersecretion of a substance. (2)

5.3.2 Diabetes mellitus. (2)

5.3.3 High levels of glucose in the blood. (2)

5.3.4 - Kidneys cannot re-absorb all the glucose.
- Excess glucose is expelled in the urine. (2)

5.3.5 - Tiredness.
- Large quantities of dilute urine containing glucose is produced.
- Great thirst. (3)

5.3.6 Depending on the type of Diabetes, but in some cases daily
injections of insulin are necessary. (2)

5.3.7 High levels of glucose in the blood. (1)

5.4 5.4.1 1 – Placenta
2 – Umbilical cord
3 – Foetus
4 – Amnion
5 – Amniotic fluid
6 – Mucus plug
7 – Vagina
8 – Cervix
9 – Perimetrium
10 – Myometrium
11 – Endometrium (11)

5.4.2 - Respiration
- Nutrition
- Excretion
- Protection
- Endocrine gland (Any 3) (3)

5.4.3 - Mechanical shock
- Temperature regulation
- Dehydration
- Adhering to the uterine wall.
- Malformation due to gravity. (Any 2) (2)

[50]

TOTAL SECTION B: 200
GRAND TOTAL: 300