MARKING GUIDELINES

EXAMINATION	NATIONAL SENIOR CERTIFICATE
GRADE	12
DATE	MAY/JUNE 2024
SUBJECT	LIFE SCIENCES
PAPER	1
MARK TOTAL	150
DURATION (HOURS)	2 ½
NUMBER OF PAGES	12

SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE

SUID-AFRIKAANSE KOMPREHENSIEWE ASSESSERINGSINSTITUUT

PRINCIPLES RELATING TO THE MARKING OF LIFE SCIENCES

1. **If more information than marks allocated is given**
   Stop marking when maximum marks are reached and place a wavy line and 'max' in the right-hand margin.
2. **If for example, three reasons are required and five are given**
   Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If the whole process is given when only part of it is required**
   Read all and credit relevant parts.
4. **If comparisons are asked for, but descriptions are given**
   Accept if differences/similarities are clear.
5. **If tabulation is required but paragraphs are given**
   Candidates will lose marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required**
   Candidates will lose marks.
7. **If flow charts are given instead of descriptions**
   Candidates will lose marks.
8. **If sequence is muddled and links do not make sense**
   Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.
9. **Non-recognised abbreviations**
   Accept if first defined in the answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of the answer if correct.
10. **Wrong numbering**
    If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
11. **If language used changes the intended meaning**
    Do not accept.
12. **Spelling errors**
    If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names are given in terminology**
    Accept provided it was accepted at the memo discussion meeting.

14. **If only letter is asked for, but only name is given (and vice versa)**
    Do not credit.
15. **If units are not given in measurements**
    Candidates will lose marks. Memorandum will allocate marks for units separately.
16. **Be sensitive to the sense of an answer which may be stated in a different way**
17. **Caption**
    All illustrations (diagrams, drawings, graphs, tables, etc.) must have a caption.
18. **Code-switching of official languages (terms and concepts)**
    A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in the learners' answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.
19. **No changes must be made to the marking memoranda without consulting the SACAI CHIEF MARKER and SACAI MODERATOR and where applicable, also the UMALUSI MODERATOR**

SECTION A

QUESTION 1

1.1

1.1.1	C	✓✓
1.1.2	C	✓✓
1.1.3	C	✓✓
1.1.4	D	✓✓
1.1.5	A	✓✓
1.1.6	D	✓✓
1.1.7	D	✓✓
1.1.8	C	✓✓
1.1.9	D	✓✓

(9x2) = [18]

1.2

1.2.1 Gestation ✓

1.2.2 Meninges ✓

1.2.3 Chemical ✓ defence

1.2.4 Central ✓ nervous system

1.2.5 Apical dominance ✓

1.2.6 Aqueous humor ✓

1.2.7 Gametogenesis ✓

(7 x 1) = [7]

1.3

1.3.1	B only	✓✓
1.3.2	B only	✓✓
1.3.3	A only	✓✓
1.3.4	Both A and B	✓✓

(4x2) = [8]

1.4

1.4.1 a) G ✓ - Ovaries ✓ / ovary (2)

b) F ✓ - Pancreas ✓ (2)

c) E ✓ - Adrenal ✓ gland (2)

1.4.2 a) Testosterone ✓ (1)

b) Thyroxin ✓ (1)

c) Growth hormone ✓ / TSH / FSH / LH / prolactin (1)

[9]

1.5

1.5.1 a) Ovulation ✓ (1)

b) Menstruation ✓ (1)

c) Corpus luteum ✓ (1)

1.5.2 a) FSH ✓/ follicle stimulating hormone (1)

b) Oestrogen ✓ (1)

c) LH ✓/ luteinising hormone (1)

1.5.3 No ✓*

- The corpus luteum degenerates ✓/ becomes smaller in size (2)

[8]

TOTAL SECTION A: [50]

SECTION B

QUESTION 2

2.1

2.1.1 Thermoregulation ✓ (1)

2.1.2 Diagram A ✓ (1)

2.1.3 37 ✓ °C ✓ (accept any value between 36 °C and 37.5 °C) (2)

2.1.4 a) - Less blood flows to the sweat glands ✓
- Sweat glands will become less active ✓
- Less sweat ✓ will be released **(any 2)** (2)

b) - Blood vessels will constrict ✓ / vasoconstriction takes place
- Less blood moves to the surface of the skin ✓ (2)

c) - Skin will appear paler ✓/ goose bumps will be visible. (1)

[9]

2.2

2.2.1 30 beats per minute ✓ / bpm (1)

2.2.2 - The patient's heart rate was very low ✓
- In order to increase her heart rate ✓ (2)

2.2.3 - Adrenalin redirects blood flow from the digestive system ✓
- to the heart and lungs ✓/ muscles
- Adrenalin also inhibits peristalsis ✓ **(any 2)** (2)

2.2.4 Table representing the heart rate of a patient before and after intravenous adrenalin.

Time (minutes)	Heart rate (beats per minute)
2	30
4	120
6	80
8	75
10	70

Rubric for assessing the table		
Caption with both variables (heart rate and time)	**C**	1 mark
Column headings with units	**H**	1 mark
Data 4 values correct 8 values correct All values correct If all points from graph are captured, only award 1 mark.	**D**	 1 mark 2 marks 3 marks

(5)

[10]

2.3.

2.3.1 a) Ovipary ✓/ oviparous (1)

b) Vivipary ✓/ viviparous (1)

2.3.2 Internal ✓ fertilisation (1)

2.3.3 The yolk sac is smaller than the embryo in mammals compared to fish ✓

OR

The yolk sac is larger than the embryo in fish compared to mammals (1)

2.3.4 – In mammals the embryo receives nutrients directly from the mother ✓ through the placenta

– the yolk sac in fish provides the only source of nutrients ✓ for the developing embryo. (2)

2.3.5 Fish ✓*

- Increases the chance of fertilisation ✓
- as external fertilisation reduces the chance of fertilisation. ✓

(compulsory mark * + any 1) (2)

[8]

2.4

2.4.1 Sperm motility increases as temperature increases up to 35°C ✓ thereafter sperm motility will decrease ✓ (2)

2.4.2 a) Temperature (°C) ✓ (1)

b) Number of motile sperm (per 1 million) ✓ (1)

c) 35 °C ✓ (1)

2.4.3 Reliability will be decreased ✓✓ (2)

2.4.4 - Enzymes ✓ responsible for cellular respiration
- denature. ✓ (2)

[9]

2.5

2.5.1 a) Uterus ✓/ uterine wall (1)

b) Vagina ✓/ vaginal canal (1)

2.5.2 a) 2 ✓ (1)

b) 5 ✓ (1)

c) 4 ✓ (1)

d) 1 ✓ (1)

2.5.3 - Germinal epithelium in the ovary ✓
- undergo mitosis ✓
- to form numerous follicles ✓
- at the onset of puberty ✓
- under the influence of FSH ✓
- One cell enlarges ✓
- and undergoes meiosis. ✓
- Of the four cells that are produced
- only one cell matures to form a haploid ovum ✓ **(any 4)** (4)

2.5.4 – Tubal ligation prevents the ovum from travelling down the Fallopian tube ✓ after ovulation
– and prevents sperm from reaching the ovum in the Fallopian tube. ✓ (2)

2.5.5 - The ovaries are still able to secrete oestrogen and progesterone ✓ for the thickening of the endometrium./ Functioning of the ovaries are not influenced by tubal ligation.
- FSH and LH are still secreted ✓ to stimulate the development of the follicle and ovulation. (2)

[14]

TOTAL QUESTION 2: [50]

QUESTION 3

3.1

3.1.1 Pathway along which nerve impulses travel from the receptor to the effector. ✓ (1)

3.1.2 1 – White matter ✓
7 – Grey matter ✓ (2)

3.1.3 Synapse ✓ (1)

3.1.4 - Ensures that impulses only travel in one direction. ✓
- Amplifies impulses.
- Prevent the overloading of the brain.
- Impulses can be transferred to more than one neuron and can influence more than one target organ. **(mark first ONE only)** (1)

3.1.5 - Stimulus is received by the receptors ✓ in the skin.
- The stimulus is converted into an impulse ✓
- and carried along the sensory neuron part 3 ✓*
- through the dorsal root ✓
- into the spinal cord .✓
- The impulse is transmitted to part 2 the interneuron ✓*
- via a synapse ✓
- where it will be interpreted. **(2 compulsory marks * + any 3)** (5)

3.1.6 - The stimulus will be felt ✓ / skin will burn
- hand will not be moved away from the flame ✓ / reflex action will not take place. (2)

3.1.7 $\frac{1.5}{75}$ ✓ $= 0.02$ ✓ s ✓ (3)

[15]

3.2

3.2.1 a) A ✓ - Iris ✓ (2)
b) C ✓ - Choroid ✓ (2)
c) E ✓ - Optic nerve ✓ (2)
d) D ✓ - Yellow spot ✓ / fovea centralis (2)

3.2.2 - Cornea is convex ✓ to ensure the refraction of light. ✓
- Cornea is transparent ✓ to allow light to pass through ✓ to the retina.
(any 1 x 2) (mark first ONE only) (2)

[10]

3.3

3.3.1 a) B ✓✓ (2)
b) C ✓✓ (2)

3.3.2 Accomodation ✓*
- Ciliary muscles relax ✓
- Suspensory ligaments become taut ✓/ tighten
- Tension on the lens increases ✓
- The lens becomes less convex ✓
- The refractive power of the lens decreases ✓/ light is less refracted
(compulsory * mark + 4) (5)

[9]

3.4

3.4.1 Ossicles ✓ (1)

3.4.2 - Absorbs excess vibrations/ pressure from the inner ear ✓
- Prevents the distortion of sound **(mark first ONE only)** (1)

3.4.3 Part A/ tympanic membrane/ tympanum has a larger diameter ✓ compared to part C/ the oval window which has a smaller diameter. ✓ (2)

3.4.4 Eustachian tube ✓*
- Pressure cannot be equalised on both sides of the tympanic membrane/ tympanum ✓
- causing it to burst ✓ rupture. **(compulsory * mark + 2)** (3)

[7]

3.5

3.5.1 Growth movement in plants in response to light. ✓ (1)

3.5.2 - Acts as the control ✓
- To prove that shoots grow due to auxin production in the tip of shoots ✓ (2)

3.5.3 - No growth will take place ✓
- as there are no auxins ✓ present. (2)

3.5.4 - The high concentration of auxins on the right side ✓
- will stimulate cell elongation only on that side ✓
- causing the shoot to grow faster on the right side ✓
- The left side has a lower concentration of auxins ✓
- causing slower growth on the left side ✓ **(any 4)** (4)

[9]

TOTAL QUESTION 3: [50]

TOTAL SECTION B: [100]

GRAND TOTAL: [150]