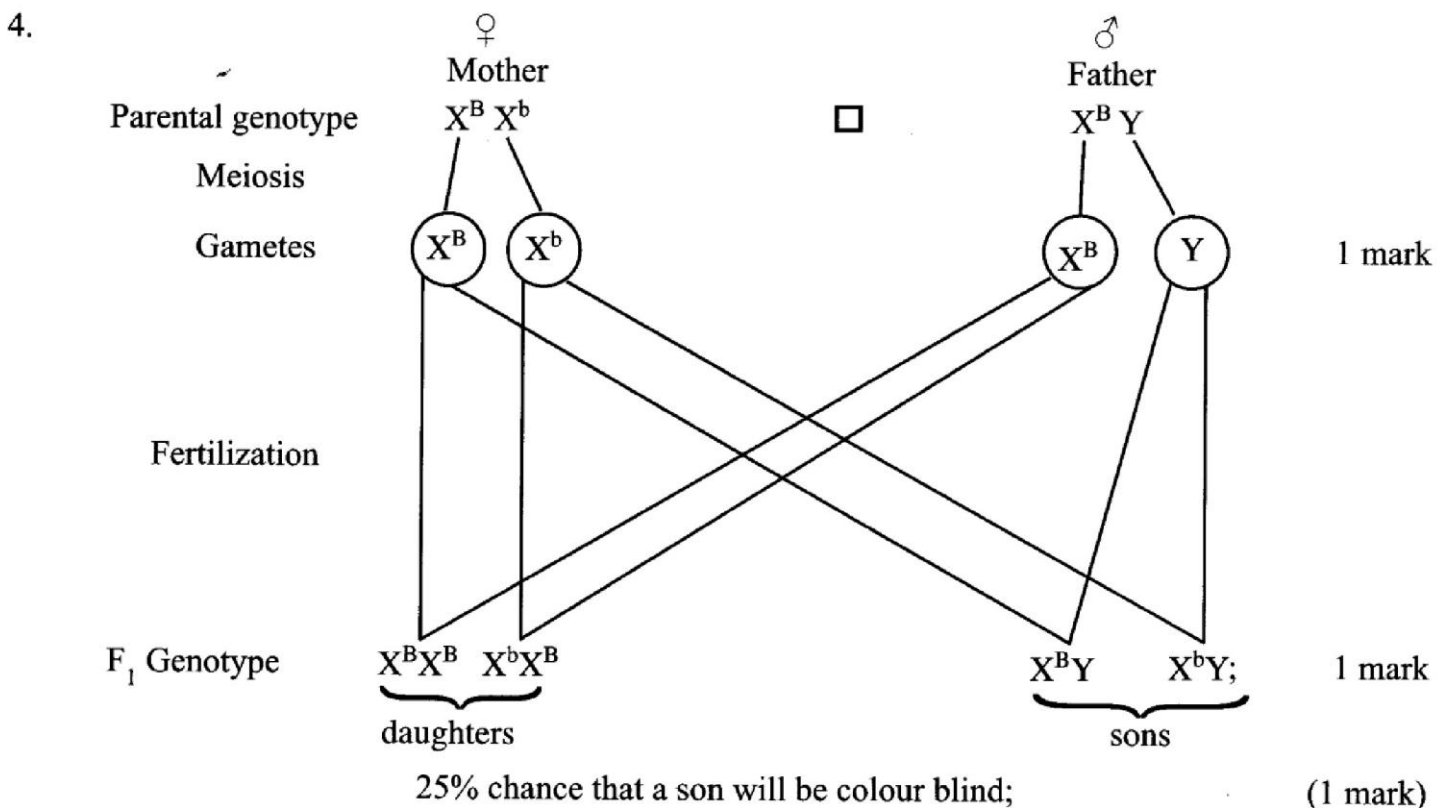


4.5 BIOLOGY (231)

4.5.1 Biology Paper 1 (231/1)

1. (a) The scientific system of giving **two** names (Genus and species) to living organisms; (1 mark)
- (b) The Genus name starts with a capital letter while the species name starts with a small letter;
The two names are typed in italics/two names underlined separately; (2 marks)
2. (a) The pentadactyl limb/homologous structures; (1 mark)
- (b) Divergent evolution/adaptive radiation; (1 mark)
- (c) Comparative anatomy; (1 mark)
- (d) It allows the organisms to exploit different habitats to reduce competition; (1 mark)
3. (a) (Antigen) B;
Rhesus (antigen)/Rheus factor/Antigen D
- (b) Has antibody **a** in the blood plasma of the recipient and will correspond with antigen **A** in the donor's blood, hence there will be antigen antibody reaction/agglutination.



OR

Punnet square

Parental genotypes $X^B X^b$ × $X^B Y$

♀ \ ♂	X^B	Y
X^B	$X^B X^B$	$X^B Y$
X^b	$X^B X^b$	$X^b Y$

25%;

5. (a) (i) To hold the specimen in place;
 (ii) Protects specimen from dehydration/drying up/dust particles;
 Protect objective lens from staining. (2 marks)
- (b) Click the low power objective lens into position. Bring it down to the lowest level using the coarse adjustment knob;
 With eyes on the eyepiece lenses and using the coarse adjustment knob gradually raise/lower the low power objective lens to bring the specimen into focus; (2 marks)
6. (a) Osmosis; (1 mark)
- (b) Absorption of water from the soil; opening and closing of stoma; feeding in insectivorous plants; support (in seedlings, leaves, herbaceous plants);
 Movement of water from cell to cell in plants.
 Any correct 1 (1 mark)
- (c) The thistle funnel gained water by osmosis; because the sucrose solution was hypertonic; (2 marks)
7. - Thin/elastic outer wall; it bulges outwards;
 - Thick/less elastic inner wall; it curves to open the stomata/straightens to close the stomata;
 - Has chloroplasts; for photosynthesis/synthesized sugar (glucose/sucrose/fructose) that is osmotically active. (4 marks)
8. (a) (i) *Plasmodium spp/malariae, vivax, Ovale, falseparum*;
 (ii) Anopheles female mosquito; (2 marks)
- (b) - Controlling mosquitoes/vectors/cleaning breeding sites/draining stagnant water/use of insecticides;
 - Vaccination/taking prophylactic drugs;
 - Sleeping under mosquito nets / use of mosquito repellants.
 Any two correct (owtte) (2 marks)
9. (a) To show that carbon (IV) oxide is produced during respiration in plants; (1 mark)
- (b) (i) Absorb carbon (IV) oxide from the (incoming) air;
 (ii) Exclude light / to prevent photosynthesis; (2 mark)

- (c) No colour change in tube F / no observable colour change.
Carbon (IV) oxide removed/absorbed from air by potassium hydroxide. (2 marks)

10. a)

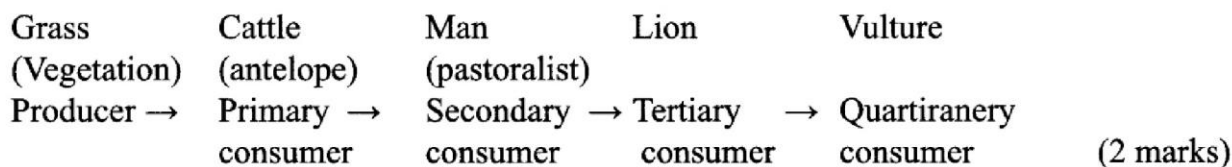
Structure	Chimpanzee Skull	Human Skull
Parietal bones	- less curved/flatter - towards the back - smaller	- more curved - more central - larger
Mandibles	- larger	- smaller
Browridge	- thicker /more protruding - conspicuous/prominent	- less protruded - less conspicuous/prominent

- (b) Accommodate large sized brain in humans; (1 mark)

11. - Stomata (in leaves);
- Lenticels (in stems and roots)/pneumatophores;
- Epidermis (roots)
- Cuticle (2 marks)

12. (a) (i) Pyramid of biomas represents total dry mass weight of organisms in each trophic level;
(ii) While pyramid of numbers represents the total number of organisms at each trophic level/feeding levels/nutrition levels; (2 marks)

- (b) Appropriate examples for;



13.

Mitosis	Meiosis
- two daughter cells	- Four daughter cells
- Daughter cells diploid	- Daughter cells haploid/are gametes
- Identical to mother cell/no variation	- Results in variation

(3 marks)

14. (a) Smooth muscles/visceral muscles; (1 mark)
Cardiac muscles; (1 mark)

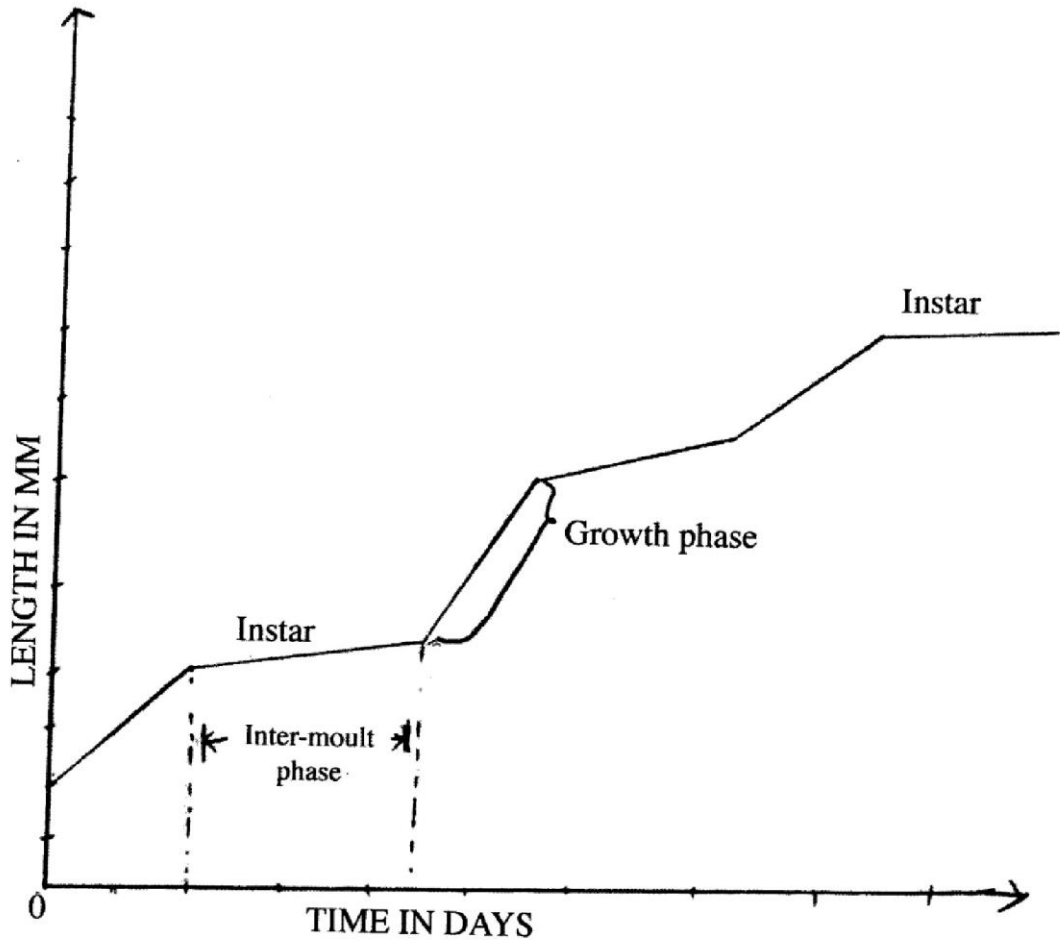
- (b) Smooth muscles - tubular visceral organs; (1 mark)
Cardiac muscles - heart (1 mark)

15. (a) (i) Mitosis;
(ii) Formation of two daughter cells. (2 marks)

- (b) (i) Metaphase; (2 marks)
(ii) Chromosomes are at the equator.

16. **Millipedes** **Centipedes**
- | | |
|--|--|
| - Cylindrical body | Dorso - ventrally flattened |
| - Head has two clumps of many simple eyes | Head has a pair of simple eyes |
| - Each segment has two pairs of walking legs (except the first thoracic segment) | Each segment has a pair of waking legs |
| - Head has a pair of short antennae; | Head has a pair of long antennae. |
| - No poison claws | Has poison claws |
| - Three body parts - head short, throrax, and trunk | Two body parts - head and trunk |
| - Has anterior genital aperture | Has aposterior genital aperture |
| - Has 9 - 100 segments | Has 15 - 21 segments |
- (4 marks)
17. (a) (i) Has gastric glands; that secrete gastric juice; (2 marks)
(ii) Thick muscular wall; that contract and relax;
Accept a component of gastric juice (pepsin, Rennin, mucus, hydrochloric acid). (2 marks)
- (b) - Used in plant respiration to produce energy;
- Converted to starch/sucrose/lipids/proteins/cellulose and stored; for future use. (2 marks)
18. - P - the low temperature/freezing temperature; inactivated enzymes; (2 marks)
- Q - Boiling eliminated oxygen; oil layer prevented entry of oxygen necessary for respiration during growth; (3 marks)

19. (a)



(b) Intermittent growth is as a result of the shedding of the exoskeleton/moulting/ecdysis. The growth rate slows down (flattening) as the exoskeleton hardens; after moulting, growth occurs rapidly (steep slope) until the exoskeleton hardens.

20. Pain receptor → Sensory neurone; Interneurone → CNS; Motor neurone → Muscle.
OR

Pain receptor → sensory neurone; inter neurone → CNS → interneurone;
motor neurone → Muscle.

Pain receptor → sensory neurone; CNS → interneurone; motor neurone → muscle