TERM 2 – DECEMBER 2021
FORM 4 – BIOLOGY PAPER 1

MARKING SCHEME

1. a) (2 mks)
   - ✓ Have mammary glands;
   - ✓ Have external ears /pinna;
   - ✓ Body covered with fur /hairs;

   b) Genus; (1 mk)

2. a) Myofibril; rej myofibrils (1 mk)

   b)

Tendon	Ligament
Connective tissue that joins bones to muscles	Connective tissue that joins bones to bones;

(1 mk) mark as a whole

3. (2 mks) mark the first two
   - ✓ Prevent dirt /dust from getting into the specimen;
   - ✓ Remove air bubbles;
   - ✓ Hold specimen into place;
   - ✓ Protect objective lens from staining;

4. a) Turning / manipulation of grass during cutting by teeth; (1 mk)

   b) Piercing / tearing / griping;

5. a)
   - ✓ Autotrophic nutrition; (1 mk)
   - ✓ Limited movement; (1 mk)
   - ✓ Growth occurs at specific regions; (1 mk)

   b) (i) Cytology; (1 mk)
   (ii) Microbiology; (1 mk)

6. a) Passage of ova, site for fertilization; (1 mk) any one correct
   b) Temporary storage of sperms; (1 mk)
   c) Hold / support testes / protection of testis; (1 mk)

7. a) Animals use carbohydrates for respiration when they are amply supplied with food; (1 mk)
   b) Animals use fats for respiration when the carbohydrates reserves are exhausted; (1 mk)
   c) Animals use tissue proteins during starvation, when the carbohydrates and fat are exhausted (1 mks)

8. Convergent evolution occurs when organisms with <u>different ancestral origin</u> develop analogous structures.
   Divergent evolution occurs when organisms with <u>common ancestral origin</u> adapt along different lines; (1 mk) mark as a whole

9.
- ✓ Lack of food / algae;
- ✓ Presence of predators;
- ✓ Presence of disease causing microorganism;
- ✓ Insufficient oxygen in water;

Mark the first three (3 mks)

10. (a) (i) Objective lens – contributes to the magnification of image and brings it to the focus (1 mk)
(ii) Fine adjustment knob – move the body tube through smaller distances to bring the Image into sharp focus (1 mk)

(b) Length of one cell = $\frac{\text{diameter of field of view ;}}{\text{number of cells}}$

$= \frac{6000}{66} = 90.9\ \mu m;$ (2 mk)

11. (3 mks)
- ✓ Iris of the eye;
- ✓ Cilliary body;
- ✓ Erecto pili muscle;

12. (a) Melanin – screen against ultra violet rays from the sun; (1 mk)

(b) Sebum – Keeps the hair and epidermis supple and waterproof; (1 mk)
- Contains antiseptic substances for protection against micro organisms;

(c) Adipose fat deposit – storage of energy;

13.
- ✓ Enables in water conservation in tissues of plants;
- ✓ Reduce water loss by evaporation and transpiration;
- ✓ Humid air accumulates in the cavities this reduces diffusion gradient between the inside of the leaf and immediate environment and thus reducing the rate of transpiration;

14. (i) carbon IV oxide + Ethanol + Energy; (1 mk)
(ii) Lactic acid + Energy; (1 mk)

15. Lamarck's theory of evolution is not accepted because evidence does not support Lamarck's theory of use and disuse; acquired characteristics are not inherited; characteristics are found in somatic cells only; (2 mks)

16. Animals have complex excretory products as compared to plants that have simple excretory Products; animals have more metabolic activities hence their wastes accumulate to toxic levels requiring specialised organs for its elimination; (2mks)

17. (a) Thigmotropism / Haptotropism; Rej. Thigmotrophism or haptotrophism (1 mk)

(b) Part of the tendril in contact with support causes migration of Auxin to opposite; side leading to Faster cell division /growth on one side not in contact with the support; this causes the tendril To curl /coil /curve around the support; (3 mks)

18. (a) A condition in which the rate of water loss is more than the rate of absorption and plant droops; (1 mk)

(b) Rate of active transport increases with increase in temperature up to optimum temperatures;
Faster increase in temperature slows down the rate of active transport; (2 mks)

19. (4 mks)
- ✓ Have thin epithelium to reduce distance over which gases diffuse;
- ✓ Have large surface area for rapid diffusion of gases;
- ✓ Highly vascularised to transport the diffusing gases;
- ✓ Have a moist surface to dissolve the respiratory gases;

20. (a) adult and larvae exploits different food niches thus do not compete for food; pupa can survive adverse conditions since its dormant /encysted / non feeding stage; (2 mks)

(b) Primary growth is the increase in length /height of a plant due to cell division and elongation of Apical meristem while secondary growth is the increase in width / girth of a plant stem and root due to cell division and elongation of vascular and cork cambium ; ; (2 mks)

21. a) X- Carbon IV oxide; (2 mks)

Y- Oxygen;

b) 19.0-10.6 =8.4 cm^3 ;; (2 mks)

22. (i) Stigma, Style, Ovary; (1 mk) (All parts must be present in order to score)

(ii) Anther & Filament; (1 mk)

23. Aerenchyma; (1 mk)
Epidermis; (1 mk)

24. Seeds stored for too long due to depletion of food reserves;
Destruction of embryo by pests;

25. (3 mks) mark the first two
- ✓ Downs syndrome;
- ✓ Turners syndrome;
- ✓ Klinefellers syndrome;

26. Epicotyl;

27.
- ✓ Disease resistance;
- ✓ Early maturity;
- ✓ High yields; (2 mks)

28. Dry mass gives the actual amount of living matter in an organism; while fresh mass is dependent Of the amount of water present in an organism; (2 mks)

29. Mother -Tt; (1 mk)
Father -Tt; (1 mk)

30. (a) Papain – Used in food industry as meat tenderizer; (1 mk)
Colchicine – Used to induce polyploidy and in cancer therapy; (1 mk)
Tannin – Used for tanning hides and skin in manufacture of leather; (1 mk)

(b)
- ✓ Remain active throughout the day;
- ✓ Can exploit a wide range of ecosystem; (2 mks)