**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 different ancestral origin develop

 analogous structures.

 Divergent evolution occurs when organisms with common ancestral origin 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 = diameter of field of view ;

 number of cells

 = $\frac{6000}{66}$ = 90.9 µm; (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 cm3 ;; (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)