SUNRISE EXAMINATION
BIOLOGY 1 FORM 3
MARKING SCHEME

1. a) Biochemistry; 1mk
   b (i) First 1
   - Names not underlined separately/written in italics;
   - Generic name written in capital letters; mark the 1st one
   1mk
   (ii) Musca domestica; 1mk
2. a) Cell membrane contains a lipoprotein while cell wall contains cellulose; 1mk
   b) Magnification = Image/Object
   Actual diameter = (2x1000)µm/800;
   = 2.5µm; 2mks
3. Haemolysis is the bursting of an animal cell/RBC when it absorbs water by osmosis from a hypotonic solution. Plasmolysis is the shrinking of a plant cell as a result of losing water by osmosis to a hypertonic solution. 2mks
4. a) 1/2 mk each=2mks
   A-Diastema
   B-Hard pad
   C-Lower jaw/mandible
   D-Molar
   b) Turning of food by tongue/prevent mixing of chewed and unchewed food;
   1 mk
5. a) Lack antigens that would agglutinate with corresponding antibodies of recipient;
   1mk
   b) First 2
   - doesn't change pH of plasma/blood/body fluids;
   - presence of haemoglobin in RBC; 2mks
6. a) W-Trachea;
   Y-Sternum; 2mks
   b) External intercostals muscles relax and internal intercostals muscles contract; Ribs /move downwards and inwards; 2mks
7. a) SUGAR/GLUCOSE $\longrightarrow$ CARBON(IV)OXIDE+ALCOHOL/ETHANOL + ENERGY/ATP;
   1mk
   b) Any 1
   Baking/manufacture of alcohol/manufacture of dairy products/biogas production;
   1mk
8. a) All glucose reabsorbed at proximal convoluted tubule; 1mk
   b) Proteins not filtered into glomerular filtrate as molecules too large to pass through capillary pores; 1mk
9. Stands upright when cold; trapping a layer of air that insulates body/skin against heat loss;
   2mks
10. Higher light intensity closer to the surface thus more plants; providing food for more fish;
    2mks
11. (i) Light; 1mk
    (ii) Test for starch; 1mk
    (iii) Uncovered part turned blue-black/contained starch while covered part remained brown/did not contain starch; 1mk
12. a) Sweep net; 1mk

b) Population = $\frac{\text{first capture x second capture}}{\text{number recaptured}}$

= $\frac{600 \times 300}{100}$;

= 1800; 2mks

13. Amphibia;
Pisces; 2mks

14. a) First 1
Genetic experiments/cancer therapy; 1mk

b) First 1
Meat tenderiser; 1mk

15. A–Vena cava;
B–Aorta ; 3mks

b) C- Bumps bloods over a long distance/rest of the body while chamber 8 bumps blood to shorter distance/lungs; (1mk)

16. a) Aerenchyma-Fresh water; 1mk
Pneumatophores- Salty water/salty soils/swamps; 1mk
b) Storage of air for gaseous exchange/buoyancy; 1mk

17. Transport role-Transport of proteins;
1mk
Synthetic role-Ribosomes manufacture proteins; 1mk

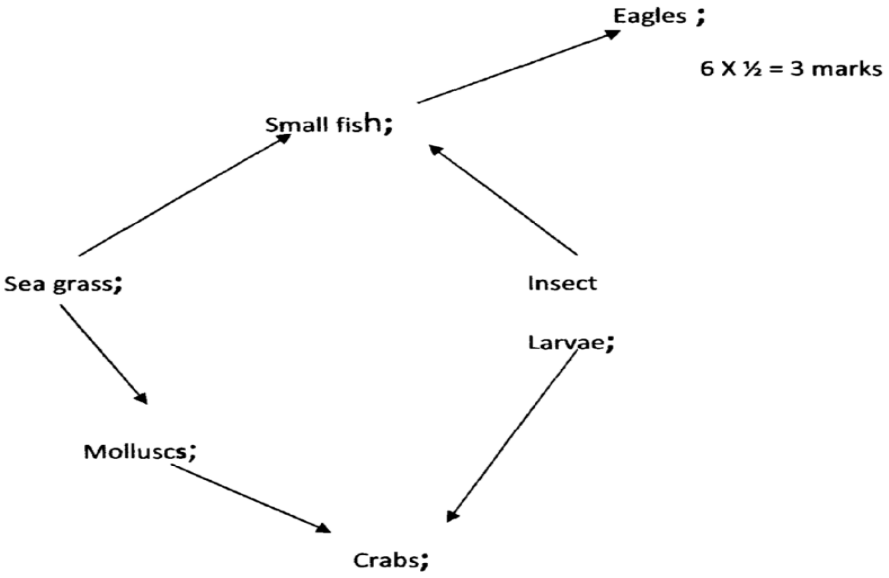
18. a) Adenosine triphosphate; 1mk
b) Require more oxygen during oxidation; insoluble in water thus not easily transported to site of respiration; 2mks

19. (a) Osmosis√1
(b) (i) Set up A – The level of solution Lin the visking tubing remained the same;√1 indicating /showing that L was Isotonic to solution K hence no osmosis; took place.
(ii) Set up B- Solution M in the visking tubing is full and the level of solution K√ has reduced in the beaker.√1 This shows that solution M was hypertonic to solution; which enables water molecules from solution K to be drawn into the visking tubing by osmosis.
(c) (i) Support√1
(ii) Feeding in insectivorous plants√1
(iii) Opening and closing of stomata
(iv) Absorption of water from the soil
(d) Excess water and dissolved chemicals accumulate in the contractile vacuole which moves to cell surface on reaching maximum size and burst releasing the contents to the surroundings.√1

20. (a) **P** - stomatal pore/oening / aperture/ stoma; rej. Stomata.
Q- Epidermal cell; Rj Epidernis (2 mks)
(b) Guard cells have chloroplasts; hence the presence of light! during the day photosynthesis occurs in the guard cells; producing sugar in the guard cells that increases osmotic pressure; water from epidermal cells enters into guard cells causing turgidity of cells; the inner walls of the guard cells are thicker than outer walls; hence outer walls stretch more (during turgidity); causing guard cells to bulge outwards; (stomata open). (7mks)
(c) Reversal / stomatal rhythm
Small stomatal pore / a perture / opening; (2mks)

21.

(a)



(b) Second / Third (1mk)

(c) Sea grass ⟶ insect ⟶ small ⟶ Eagle ⟶ Larvae ⟶ Fish

(d) The population of molluscs / insect larvae would increase; due to decreased predation; (2mks)

(e) Shows the actual amount of energy flow of a food chain; (1mark)

22. a) Water exists as a thin film in the soil between soil particles; the concentration of cell sap is greater than that of the surrounding solution in the soil; Thus drawing water molecules across the cell wall and cell membrane into the root hair cells; by osmosis; water drawn into the root hair cell dilutes the cell sap/makes it less concentrated than that in the adjacent cell; water moves into the cortex cells (of the root); across the endodermis by active transport; into the xylem vessels of the root); then conducted up into the xylem (vessels) of the stem; water is pushed/rises up the stem by root pressure; (in the xylem vessels) water rises by capillarity; cohesion and adhesion forces; into xylem of leaves; water moves as a continuous uninterrupted water column in the xylem vessels up the tree to the leaves. (Max 10 marks)