SUKELLEMO JET DECEMBER 2020 BIOLOGY PAPER 1 MARKING SCHEME

1. (a) – Entomology**;**

   (b) – Mycology**;**

2. Chilopoda**;** **Rej** – if starting with a small letter
   – wrong spelling

   Reasons
   –Has two body parts**;**
   –Has one pair of walking legs per segment**;**
   –Has long pair of antennae**;**

Reasons tied to class

3. (a) –Add three drops of iodine on the agar the colour of iodine remained brown indicating absence of starch in the agar**;**
   (b) – Sorghum seed contain (enzyme) amylase/ptyalin (acc diastase)**;** which converted/digested/hydrolysed/break down starch in the agar to maltose**;**
   (c) –To increase surface area for working/activity/action of enzyme**;**
   (d) –Brown iodine solution changes colour to blue-black since starch is not digested because the enzyme is denatured by boiling/high temperatures**;**

4. –Inspiration/inhalation and expiration/exhalation rate will increase**;**
   – Heartbeat/rate of blood circulation will increase**;**

5. (a) Non sister chromatids cross over and exchange genes**;** leading to genetic variation/recombination**;**
   (b) Meiosis**;**
   (c) Testes/ovaries**;**

6. (a) (i) – Ampulla (organ)**;**
   (ii) – Semi-circular canal(s)**;**
   (iii) – Maintenance body balance and posture in relation to movement of the head**;**
   (b) **C** – (Gelatinous) cupula**;**
   D – Sensory cell(s)**;**

7. The leaf had stomata only on the upper surface**;** which were blocked by glycerine cutting supply of carbon(IV) oxide**;** no photosynthesis takes place hence absence of starch**;**

8. (a) – Vacuole of the cortical/inner cells of the stem was hypertonic to the water**;** the inners/cortical cells absorbed water by osmosis**;** and became turgid increasing in size closing the container very tightly**;**
   (b) (i) – stem stopper remains the same/ does not close the container very tightly**;**
   (ii) – Boiling destroys the cell membrane of the stem cells preventing osmosis from occurring**;** **Tied to (b) (i)**

9. (a) **F** – Nuclear pore**;**
J – Chromatid**;**
(b) (i) – Non-disjunction**;**
(ii) – Has extra chromosome labelled H**;**
(c) – 3/three chromosomes**;**

10. – Contraction of muscles**;**

– Formation of strong /teeth**;**

11. (a) – Pond **R** (**Acc** – pond in which the fish survived)**;**
(b) – Inadequate oxygen (in the water for respiration)**;**
(c) – Reduce carbon(IV) oxide concentration in the water**;**
– Increases oxygen concentration in the water**;**
– Provide food for the fish/animals**;**
– Provide shelter for the fish**;**

12. (a) – Absciscic acid**;**
(b) – <u>Reduce</u> (the rate of) transpiration**;**
– Excretion**;**

13. (a)(i) – Saprophytic bacteria breakdown the organic matter (into soluble simple materials) leading to <u>decrease</u> (in amount of) organic matter downstream**;**

(ii) – Breakdown of organic matter by saprophytic bacteria releases nutrients/nitrates/ammonium/phosphates/sulphates <u>increasing</u> concentration of ions in the water**;**

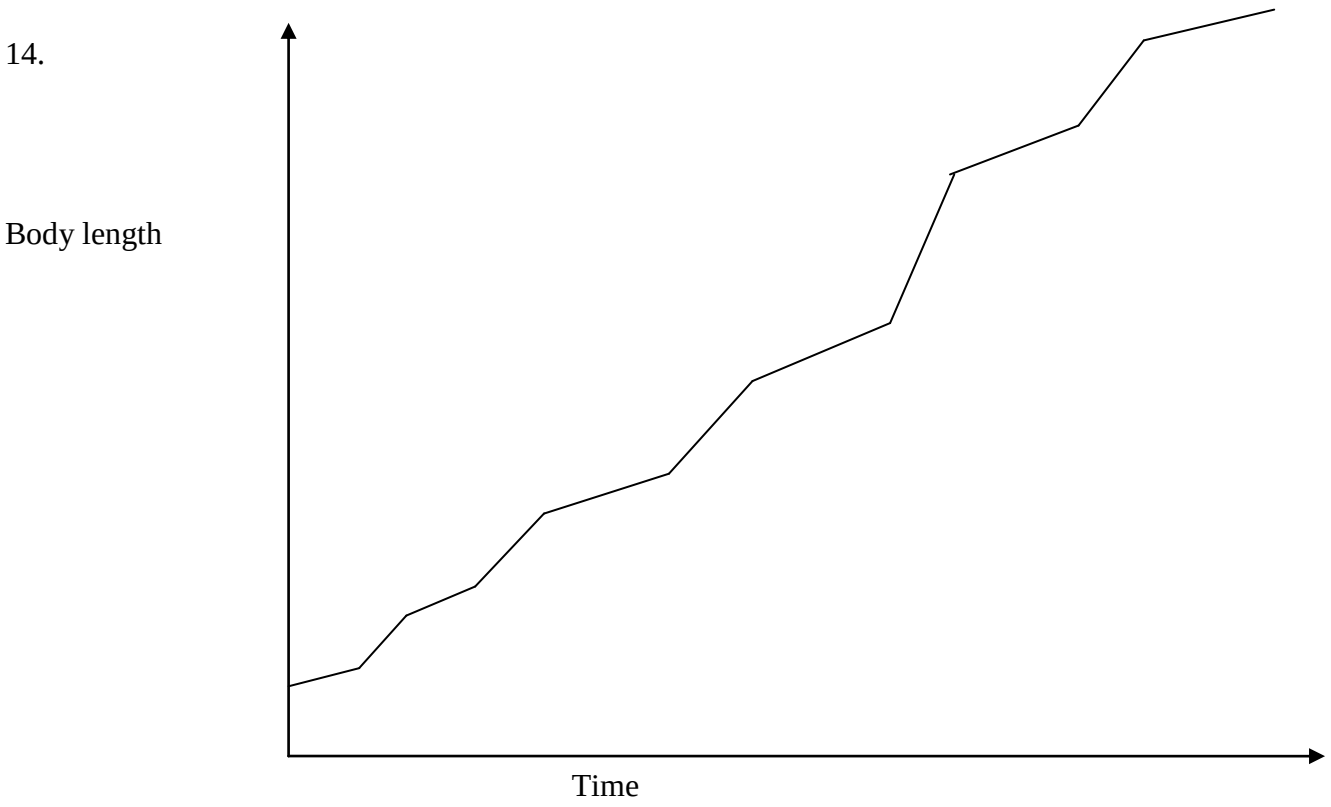
(iii) – Saprophytic bacteria use up dissolved oxygen for respiration decreasing the amount of oxygen in the river upstream**;**

– Downstream the level of organic matter decreases decreasing activity of saprophytic bacteria increasing the level of oxygen to normal**;**

Award the any one

(b) (i) – Fish population decreases(drastically) due to insufficient oxygen/decrease in oxygen concentration**;**
(ii) – water plant and algae proliferate/increase due to increase in nutrients/phosphates/nitrates due to breakdown of organic matter by saprophytic bacteria**;**

14.



Award– Labelling of both axes 1 mark

– Curve 1 mark

15. (a) – To show that carbon(IV) oxide is produced by germinating seeds**;**

(b) **M** – Germinating seeds used up oxygen in the flask for respiration; producing carbon(IV) oxide which forms a white precipitate with calcium hydroxide solution**;**

N – Boiled seeds did not respire no carbon(IV) oxide was produced hence the calcium hydroxide solution remained clear/ no white precipitate formed in calcium hydroxide solution**;**

(c) To kill bacteria/ fungi which may produce carbon(IV) oxide**;**

16. (a)(i) – Dicotyledonae**;**

(ii) – Presence of four stamen**;** Tied to (a)(i)

(b) – Marginal(placentation)**;**

(c) (i) – Sepal/calyx**;**

(ii) – Develop into seeds**;**

17. – Have actin and myosin/actomyosin/sacromeres/contractile proteins which cause contraction and relaxation of the muscle**;**

– High density of mitochondria to provide energy for contraction**;**

– Elongated fibres/long myofibrils to allow maximum change in length**;**

18. – Production of lymphocytes (**Acc** –Agranulocytes)**;**
– Trap and destroy pathogens**;**

19. (a) (i) – Analogous structures**;**
(ii) – Have different basic structure but are modified to perform the same function**;**
Tied to (a) (i)
(iii) – Convergent evolution**;**

(b) – The immunological reactions form a precipitate; – The higher the precipitate the closer the relationship between the animals being compared**;**

20. (a) – Antigen A, antigen B, Rhesus antigen**;** **Acc** –only where all are present.
(b) – None**;**
(c) AB^+, AB^-, O^+, O^-**;** **Acc**– only where all are present

21. (a) – Erector pilli muscles contract lowering hair on the skin less air is trapped increasing heat loss**;**
– Dilation of superficial arteries increasing blood flow near the surface of the skin leading to increase in heat loss**;**
– More sweating leading to evaporation of sweat from skin leads to heat loss**;**

(b) – Going under a shade/burrowing**;**

22. (a) –Hollow bones to make them light**;**
– Have a large keel to increase surface area for attachment of pectoral/flight muscles**;**

(b) – Protection from mechanical damage**;**

– Waxy to reduce water loss**;**