**ASUMBI GIRLS HIGH SCHOOL**

**TERM 2- DECEMBER 2021**

**FORM 4 - BIOLOGY PP 2**

**MARKING SCHEME**

1

(a) C; Ammonia is very toxic and highly soluble hence requires a lot of water for dilution;

producing large amount of dilute urine; Max 2

(b) D; There is a shortage of water hence excrete little amount of using to conserve water;

2 mks

(c) **A** **D**

Short loop of Henle Long loop of Henle;

Many and large sized glomeruli Few and small sized glomeruli;

2x1= 2mks

(d) - Uses metabolic water;

- Reduced level of sweating; 2x1= 2mks

2.

1. Tympanic membrane

* Receives sound waves (from the air); and vibrates;
* To transmit them to the ear ossicles/ maleus/ stripes; Rej hammer, anvil and stirrup

2x1=2mks

1. Pinna

* Collects sound wave;
* Concentrates sound waves and directs it to the auditory meatus/ ear canal;

2x1=2mks

1. Ear ossicles

* Amplify/transmit sound vibrations; from the tymphanic membrane to the inner ear/venestra ovalis/oval window;

(b)**Two** defects of mammalian eye

* Short- sightedness/myopia;
* Astigmatism;
* Long-sightedness/hypermetropia;
* Squintedness;
* Oldsight(presbyopia);

Mark the first two 2x1=2mks)

3

(a) Fish were caught, age determined; 2 years old retained; length measured and recorded. This

was done repeatedly until a large number were measured; the total length divided by number

of fish; (4mks)

(b) Lake A has hard water with more calcium than Lake D necessary for bone formation;

Fish in A grow faster and greater bone length than fish in Lake D;

Lake A has more food which fish eat than lake D;

Max – 2mks

(c) Receives light energy directly from the sun; and energy is lost from one trophic level to the

Next; 2x1= 2mks

4.

(a) To destarch /remove starch from the leaf; Acc plant (1mk)

(b) Carbon (IV) oxide; Acc Co2 Rej if (iv) in small letter (1mk)

(c) (i) (Test for) starch; Rej Iodine test (1mk)

(ii) P- Retained the colour of iodine solution/Brown/yellow; (1mk)

Q Turned blue –black; (1mk)

(iii) P- Did not photosynthesis/No starch was formed because sodium hydroxide pellets

absorbed Carbon (IV) oxide; (1mk)

Q- Photosynthesis /starch was formed because Carbon (IV) oxide was in the flask; (1mk)

(d) Control (experiment); (1mk)

5.

(a) Sickle cell anemia; (1mk)

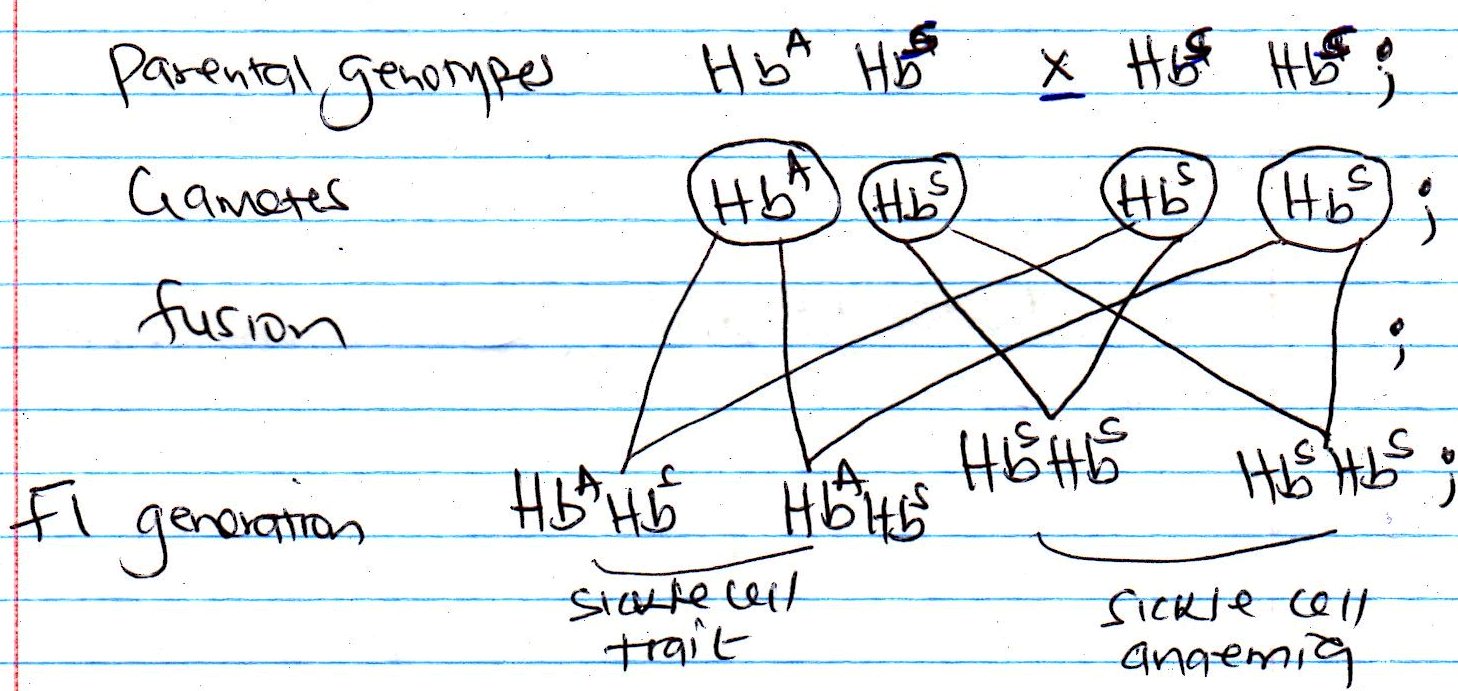
(b) Advantage – individuals having this trait hardly/rarely suffer from malaria;

Disadvantage - Suffocation due to insufficient supply of oxygen during strenuous

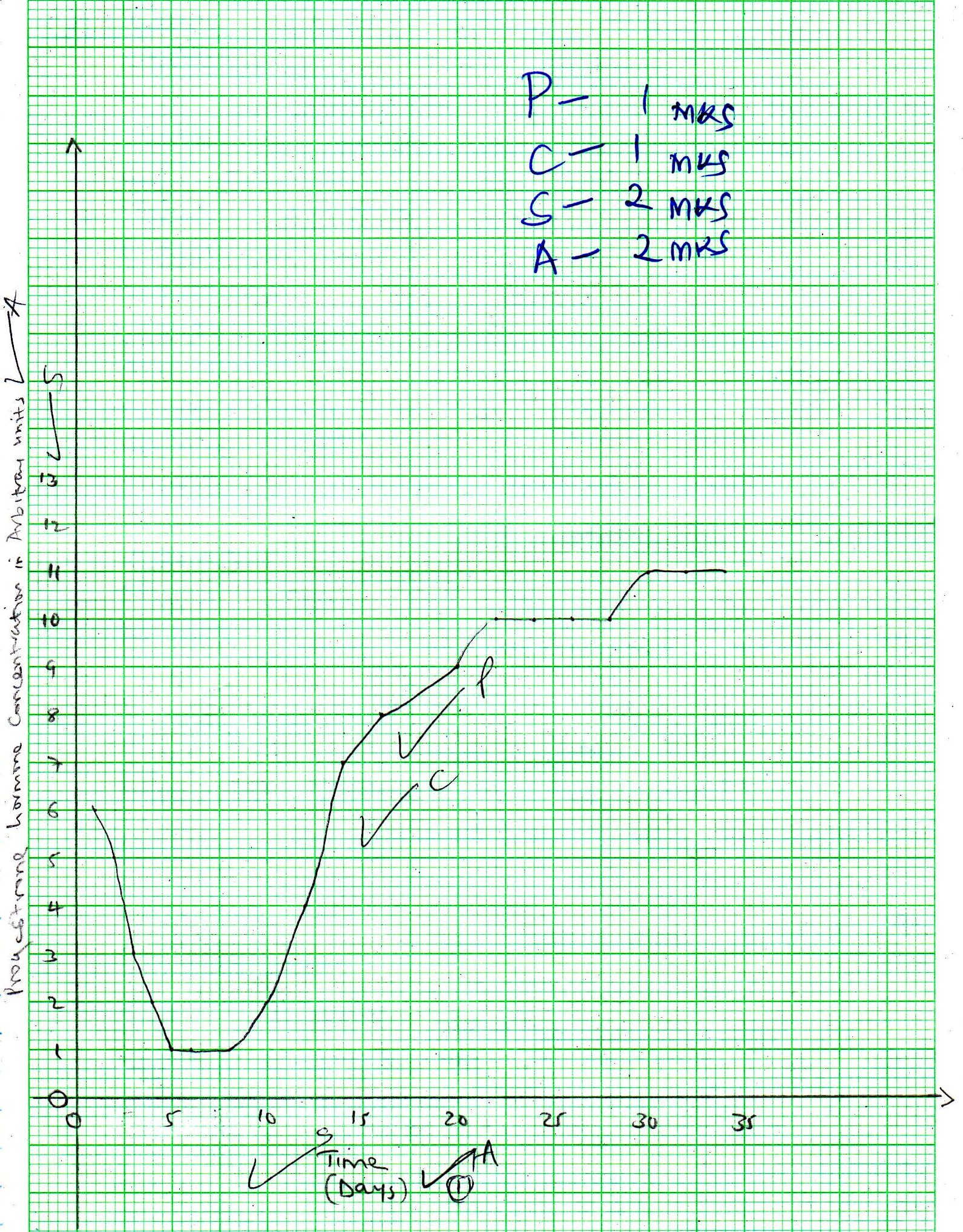
activity;

2x1= 2mks

(c) Parental phenotypes sickle cell trait



;

6. 

1. Day 1 - day 5

Level of progesterone was going down; causing the shedding of the endometrium; (2mks)

1. Day 14 – day 28

Level of progesterone increasing rapidly; this occur after menstruation to cause healing of the cells of the uterus; (2mks)

1. Day 28 – day 35

Level of progesterone increases further; this is because implantation has taken place and progesterone is required to maintain pregnancy; (2mks)

(c) Production of progesterone after 28th day increases due to release of egg and formation of

Corpus luteum; in preparation for conception; and also to maintain pregnancy; (3mks)

(d) Ovulation; (1mk)

(e) Oestrogen and luteinizing hormone

Oestrogen; – to stimulate repair and healing of the endometrium/wall of the uterus stimulates the anterior lobe of pituitary gland to produce the luteinizing hormone; (2 mks)

Luteinising hormone;- stimulates ovulation; (2 mks)

Q7.

* Water exists as a thin film in the soil between soil particles;
* The concentration of cell sap of root hair cells is greater than that of the surrounding solution in the soil;
* Thus drawing water molecules across the (cell wall and) membrane into the root hair cells; by osmosis;
* Water drawn into the root hair cells dilutes the cell sap/making it less concentrated than that in the adjacent cortex cells of the root;
* (Due to the osmotic gradient)water moves from the root hair cell into the cortex cell; Then from cell to cell (by osmosis);
* Across the endodermis by active transport; into the xylem vessels; (of the root)
* Then conducts the water up the xylem (vessels) of the stem;
* Into the xylem of the leaves;
* Water is pushed rises up by root pressure;
* (in the xylem vessels) water rises by capillarity; cohesive; and adhesive forces;
* Water moves as a continuous /an interrupted water column in the xylem (vessels) up the tree to the leaves;
* As water vaporizes from the spongy mesophyll cells, their cell sap becomes more concentrated than adjacent cells;
* This increases the osmotic pressure of the spongy mesophyll cells;
* As a result water flows into the cell from other surrounding cells, which in turn takes in water from xylem vessels within the leaf veins;
* This creates a pull/ sunction force/ transpiration pull;
* That pulls a stream of water from xylem vessels in the stem and roots;
* The transpiration pull maintains continuous column of water from the roots;

**Total points 23 Max 20**

**8. Carbohydrates digestion in human being**

(a) In the mouth; food is chewed; to increase surface area of enzyme activity;

(Saliva contains) salivary amylase ptyalin; saliva (mixes with food and) provides an alkaline medium; for amylase/ptyalin (enzyme);

Salivary amylase acts on starch and converts it to maltose;

In the duodenum; food is mixed with bile; and pancreatic juice;

Bile provides alkaline medium; for activity of duodenal enzymes; **ACC.** correct example of enzyme.

**ACC** .Sodium hydrogen carbonate for bile **Rej** Sodium bicarbonate

And neutralizes acidic chime /food from stomach;

(Pancreatic juice contains) pancreatic amylase; which converts starch to maltose; **Acc** Amylose for starch

In the ileum; epithelial cells in the ileum secretes succus eutericus/intestinal juices; which contains invertase/sucrase; which acts on sucrose and converts it to fructose and glucose;

Lactase; which acts on lactose and converts it to glucose and galactose; Maltase; which acts on maltose and converts it to glucose;

Total 23 Max 12 mks

(b) –Energy from the sun is trapped by chlorophyll in green plants; which occupy the 1st trophic

Level producers; and used during photosynthesis; food /carbohydrates are made; Energy in

form of food goes to the herbivores /primary consumers which feed on green plants; which

occupy the 2nd trophic level; in the herbivore/primary consumers food/carbohydrate is

digested; absorbed and assimilated; when carnivores/ secondary consumers; feed on

herbivores energy floes to them / to the 3rd trophic level;

Tertiary consumers feed on carnivores; etc. plants, herbivores, carnivores die;

material/energy flows to the decomposers;

Total 14 max 8