

**FORM IV JOINT EVALUATION 2017**

**JOINT EVALUATION**

**BIOLOGY PAPER 2(231/2)**

**MARKING SCHEME**

1. (a)

- Fruit brightly coloured/large/in clusters;
- Fruit scented has sweet smell/sweet aroma;
- Seeds have tough/hard testa;
- Some seeds have sticky/mucoid secretions;
- Fruits have hooks;
- Fruit fleshy/juicy/succulent;

(max 4 marks)

(b) (i) **Luteinising hormone:-**

-Stimulates ovulation;stimulates the development of remains of the graafian follicle into corpus luteum;

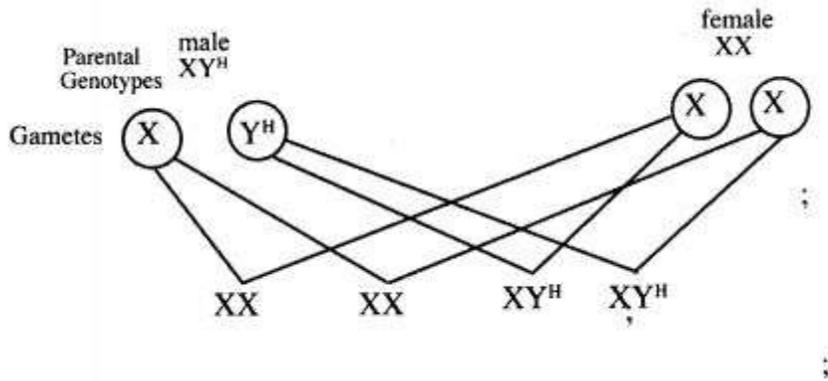
-Stimulate corpus luteum to produce progesterone; (max 2 marks)

(ii) **Oestrogen:-**

-Stimulates healing and repair of uterine lining /endometrium following menstruation;

-Stimulates pituitary gland to secrete luteinising hormone; (2 marks)

2.(a)



(b)(i) Probability of girls having hairy ears is zero '0' ;

(ii) The gene for hairy ears is on the Y chromosomes which girls do not inherit from their father; (2 marks)

(c) Haemophilia; Colour blindness; (2 marks)

3 (a) (i) Bordetella pertussis

(ii) Streptococcus pneumonia/ micoplasma pneumonia

(b) Inhaled oxygen dissolves in moisture in the alveolus; since the oxygen concentration in blood is lower than in the alveolus. Oxygen diffuses through the alveolus epithelium, the capillary wall into the plasma and finally into the red blood cells.(4 marks)

(c) Pneumatophores - grow into the air above mud/water; their lenticel for gaseous exchange; (2 marks)

4.a)(i) B -Seta/stalk;

D- Rhizoid;

(ii) A- Production of spores/sporulation;

C -Photosynthesis;

b)(i) Arthropoda;

(ii) - Segmented body;

- Jointed appendages;

- Presence of exoskeleton

5. (a) Carbonic acid/carbaminohaemoglobin/hydrogen carbonate;(1 mark)

(b) (i) Water;

(ii) Carbonic acid; (1 marks)

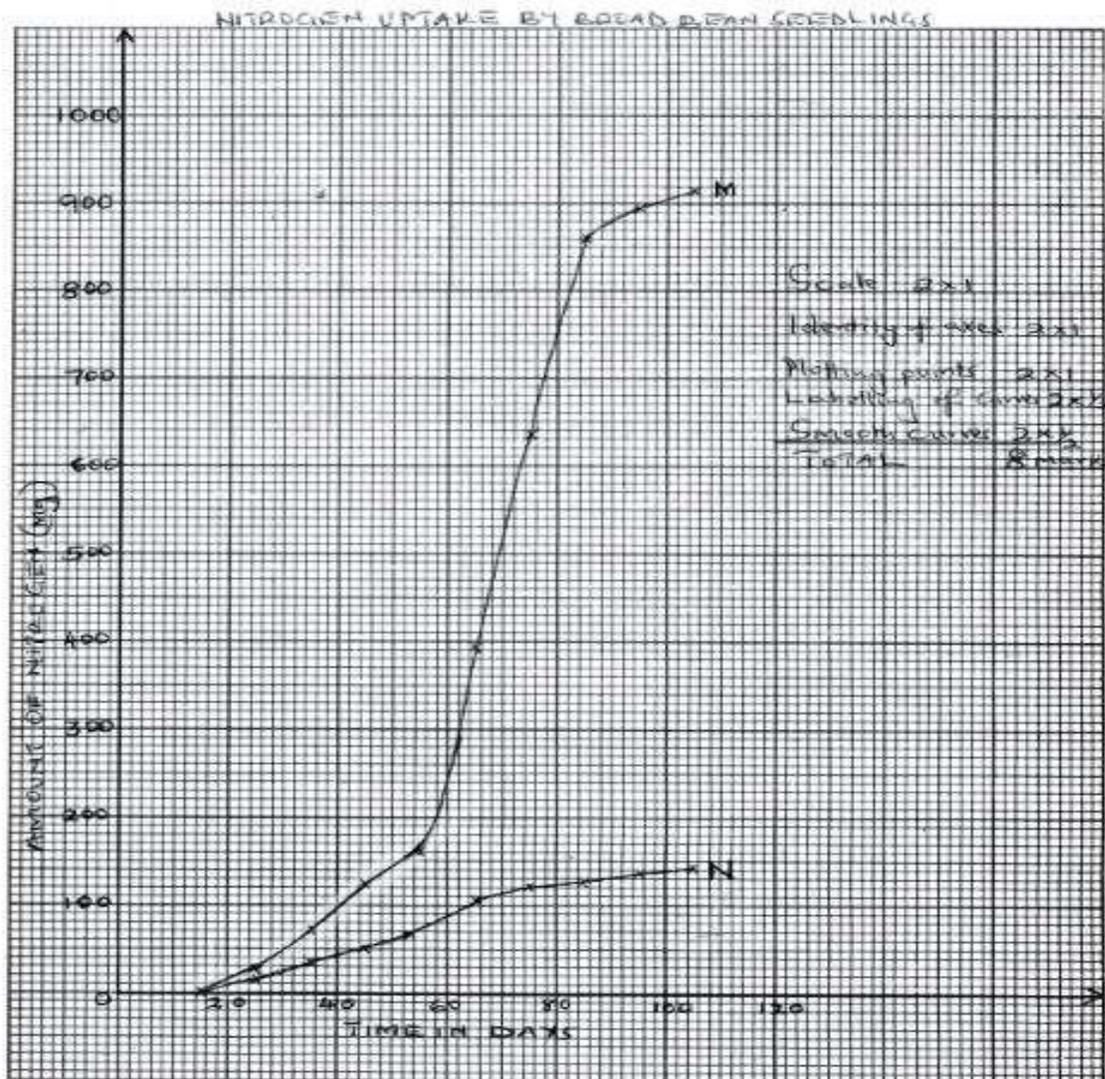
Role: catalyses reaction between carbon IV oxide and water to form (weak) carbonic acid; (2 marks)

(c) Prevents accumulation of acidity/maintains pH of blood since hydrogen ions combine with haemoglobin to form Haemoglobinic acids;

Faster; due to the catalytic effect of carbonic anhydrase ;( max 2 marks)

(d) Activates thromboplastin; thrombokinase to neutralize heparin/convert prothrombin to thrombin .(2 marks)

### SECTION B (40 marks)



6. (a) Scale Zx1 mark

Identity of axes Zx1 mark

Plotting of points Zx1 mark

Labelling of curves 1 mark (% >< 2)

Smooth curves 1 mark (% >< 2)

(c) (i) The higher the carbon (IV) oxide content in air, the higher the nitrogen uptake and vice versa; (1 mark)

(ii) More Carbon (IV) oxide in the air makes the seedlings to photosynthesize more; hence more amino acids/protein are formed in the dark stage. Formation of amino acids/protein requires nitrogen.(max 3 marks)

(d) (i) The concentration of nitrogen would remain constant; (1mark)

(ii) Despite decline in CO<sub>2</sub>; the nitrogen already absorbed/taken up by the plant Will still remain.(3 marks)

(iii) - Lightning;

-By free-living bacteria/micro organisms;

-By Rhizobium (in root nodules of legumes)(3 marks)

7. (a) Plants in arid, semi-arid and desert habitats have leaves covered with thick/waxy cuticles; that are waterproof/impermeable to water allowing for reduced rate of transpiration.

Sunken stomata; in some desert/semi arid areas plants have water accumulating in the pits; reducing rate of transpiration (as the moisture in the pit is carried away by wind.)

Most plants have few or no stomata on the upper surface of leaf; the fewer the stomata the less the water lost from the plant. Some plants have small stomata/stomatal size decrease when guard cells are flaccid thus reducing transpiration rate.

Plants with small/folding leaves expose less surface area hence reduce the rate of transpiration.

Leaves with shiny surfaces reflect light resulting reduced leaf temperatures thus reducing the rate of transpiration.

Some plants have leaves covered with hairs/scales which trap a layer of moisture in the leaf surface reducing the rate of transpiration.

Mesophyte have a thin layer of cuticle; to facilitate high transpiration rate; broad leaves exposing large area to transpiration; Many stomata on both leaf surfaces provide many apertures to enhance transpiration. (13 marks)

(b) Erector Pilli muscle relax and hair lie flat(**mark**) trapping less air(**mark**) thus reducing insulation(**mark**). Blood capillaries under the skin vasodilate and more blood is brought under the skin(**mark**) increasing heat loss(**mark**). Sweat glands release more sweat to the skin surface(**mark**); the sweat take away heat from the body when it evaporates(**mark**).

**(max 7 marks)**

8. (a) (i) Reactions in photosynthesis are catalysed by enzymes; at optimum temperature photosynthesis proceeds faster. Below optimum temperature the rate of photosynthesis decreases because enzymes are inactivated by the low temperatures / above optimum the rate of photosynthesis decreases because enzymes are denatured. (2 marks)

(ii) Chlorophyll traps energy from sunlight for photosynthesis. The higher the chlorophyll concentration the higher the rate of photosynthesis and vice versa. (2 marks)

**(b) In the mouth;**

-Food is chewed to increase surface area for enzyme activity/saliva contains salivary amylase.

-Saliva mixes with food and provides an alkaline medium for amylase enzymes.

-Salivary amylase acts on starch and converts them to maltose;

**In the duodenum ;**

-Food is mixed with bile and pancreatic juice.

-Bile provides alkaline medium for activity of duodenal enzymes and neutralizes acidic chyme from the stomach.

-Pancreatic juice contains pancreatic amylase which converts starch to maltose.

**In the Ileum;**

-Epithelial cells in Ileum secrete succus entericus which contains enzyme sucrase; which acts on sucrose and converts it to fructose and glucose.

-Lactase; which acts on lactose and converts it to galactose and glucose.

-Maltase; acts on maltose and converts it to glucose.

**(max 16 marks)**