(ii) ***K***:- Participates in clotting of blood. ***(4 marks)***

24.
- ***Light reaction***:- Grana.
- ***Dark reaction***:- Stroma. ***(2 marks)***

25.
- ***Bean plant***:- Dicotyledonae; leaves are net-veined/leaves with petiole/star-shaped xylem with Phloem in between arm of xylem/tap root system.
- ***Bat***:- Mammalia; presence of fur/hair/mammary glands. ***(4 marks)***

26. (a) ***Colchicine***:- Used in inducing polyploidy.
(b) ***Papain***:-Used as meet tenderizor. ***(2 marks)***

27. (Anaerobic) micro organism/break down harmful substances in sewage. ***(1 mark)***

28. (a) Budding.
(b) (i) ***Protandry***:- stamens/anthers/male parts mature before the carpels/pistil/female parts/Stigma of a flower.
(ii) ***Protogyny*** :- carpels mature before the stamens of a flower. ***(3 marks)***

29. Cushions foetus against shock/provide a suitable medium for embryo to grow. ***(1 mark)***

30. (a) Pelvic gridle.
(b) Femur.
(c) Obturator foramen. ***(3 marks)***

30.4.2 Biology Paper 2 (231/2)

1. (a)
- ***F***:– Oestrogen.
- ***G***:– Progesterone. ***(2 marks)***

(c)
- ***F*** :– Promotes healing and repair of the uterus.
- ***G*** :– Causes thickening of the uterine lining. ***(2 marks)***

(c) (i) Leutinizing hormones.
(ii)
- Causes ovulation.
- Induces graafian follicle to become corpus luteum. ***(3 mark)***

(d) 12^{th} to 16^{th} day ***(1 mark)***

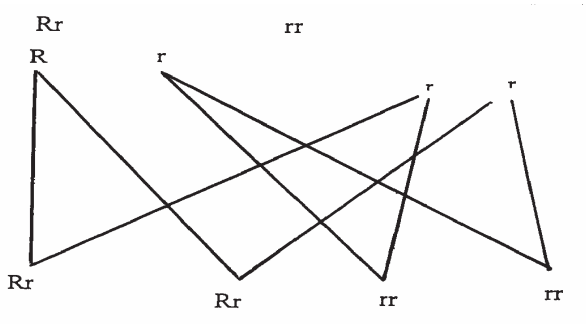
2. (a) Parental genotypes
- Round seed plants – Rr.
- Wrinkled seed plants – rr. ***(2 marks)***

(c) Gametes from

P1 i Rr ⟶ R and r
P2 ii rr ⟶ r and r ***(2 marks)***

(c)

Rr	rr	
Genotype	Rr	rr
Phenotype	Round seeds	Wrinkled seeds.



(3 marks)

(d) Test across whether an individual showing a character for a dominant gene is homozygous or heterozygous. ***(1 mark)***

3. (a) Photosynthesis. ***(1 mark)***

(b)

- Light energy.
- Chlorophyll. ***(2 marks)***

(c) (i) ***Oxygen***:- Used in respiration. Released into the atmosphere. ***(2 marks)***

(ii) ***Glucose***:- Used in respiration. Converted to sucrose/starch for storage. Used in formation of structures such as cellulose/cytoplasm ***(3 marks)***

4. (a) (i) ***Plants***: Exposing the surface area of leaf to sunlight for photosynthesis. Ensure flowers are exposed to pollination agents. Expose fruits and seeds to agents of dispersal. To resist breakage due to their own weight and that of other organisms. ***(3 marks)***

(ii) ***Animals***: For attachment of other body organs.To protect delicate organs. To maintain body shape.To enable movement and locomotion. ***(3 marks)***

(b)

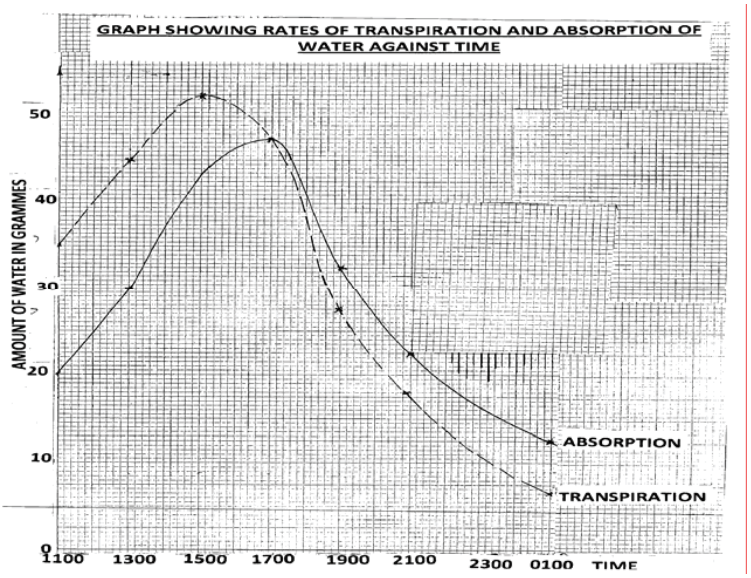
- Enable animals to search for food.
- Enable animals to search for shelter.
- Enable animals to search for water.
- Enable animals to escape predators and harmful conditions. ***(2 marks)***

5. (a) **In L1:** Inner cells gained water by osmosis; Increased in length; hence becoming turgid: Leading to curvature; the epidermal cells did not gain water because they are covered by a waterproof cuticle.
In L2: Inner cells lost water; (by osmosis) leading to flaccidity; hence the curvature. The epidermal cells did not gain water due to waterproof cuticle. ***(6 marks)***

(b)

- Support in herbaceous plant.
- Absorption of water. ***(2 marks)***

6. (a)



(7 marks)

(b) 17.00 – 19.00 hrs. ***(1 mark)***

(c) (i) Transpiration

- ***11.00 – 19.00 hrs***: (Rapid) Increase; in the rate of transpiration due to high light intensity/high temperature.
- ***10.00 – 03.00 hrs***: Decrease. in the rate of transpiration due to low light intensity (or absence of light)/low temperature. ***(3 marks)***

(iii) Absorption

- ***11.00 – 19.00 hrs***: Increase; in the rate of absorption of water to replace water lost through transpiration.
- ***19.00 – 03.00 hrs***: Decrease; in rate of absorption of water due to the fact that the rate of transpiration has declined. ***(3 marks)***

(d) Both transpiration and absorption decrease. ***(2 marks)***

(e) Wind, humidity, atmospheric pressure. ***(2 marks)***

(g)

- ***Wind:-*** The rate of transpiration is faster when it is windy/than when the air is still.
- ***Humidity:-*** When humidity is low, the rate of transpiration is faster due to a steep disfusion gradient; than when it is high.
- ***Atmospheric pressure:-*** The rate of transpiration is high at low atmospheric pressure due to a high diffusion gradient between inter cellular spaces and the atmosphere than at high atmospheric pressure. ***(2 marks)***

7. During thunderstorm nitrogen gas combines with oxygen to form nitrogen oxides. Nitrogen oxides dissolve in water to form nitric acid. Acid is deposited in the soil by rain; nitric acid combines with chemical substance to form nitrates which are absorbed by plants. In the soil, symbiotic bacteria such as Rhizobium which are found in root nodules of leguminous plants fix free nitrogen to nitrates free living bacteria such as clostridium and Azotobacter fix nitrogen to nitrates. Nostoc algae and Anabaena fix nitrogen to nitrates. Plants use nitrates to form plant proteins from nitrates. Animals feed on plants and covert plant proteins into animal proteins. Plants and animals die and are decomposed by bacteria and fungi. Decomposing plants and animals release ammonia which is converted to nitrites by nitrosomonas bacteria nitrites are converted to nitrates by nitrobacter bacteria. Nitrates in the soil can be converted to free nitrogen/denitrification by some fungi/pseudomonas/ thiobacillus bacteria.

(20 marks)

8. (a)

- Highly vascularized/network of blood capillaries.
- Large surface area for gaseous exchange.
- Thin membrane.
- Moist lining. ***(4 marks)***

(b) ***Breathing in :-***External intecostal muscles contract internal intercostals muscles relax lifting the ribcage upwards and outwards. Muscles of diaphragm contract hence, it flattens the volume of the thoracic cavity increases, while the pressure decreases. Higher air pressure in the atmosphere forces air into lungs through nose.

Breathing out:- External intercostals muscle relax while intercostals muscles contract moving the ribcage downwards and inwards. The muscles of diaphragm relax hence, the diaphragm assumes dome shape, the volume of thoracic cavity decreases while pressure increases forcing air out of the lungs through the nose. ***(16 marks)***

30.4.3 Biology Paper 3 (231/3)

1. (a) ***A:*** Liver.
B: Stomach.
C: Spleen.
D: Small intestines.
G: Duodenum. ***(5 mark)***

(b) ***E:*** Store faeces/undigested food/indigestible food materials.
F: It contains/stores/harbours bacteria; which produce cellulose/enzymes to breakdown/digest cellulose/digestion of cellulose. ***(3 marks)***

(c) Colon/large intestines. ***(1 mark)***

(d) (i) Male. ***(1 mark)***
(ii) Presence of the prostrate gland/testis/seminal vesicles. ***(1 mark)***

(e) (i) $\frac{9}{15} = X0.6 / \frac{3}{5}$

(ii) $\frac{14.6cm}{0.6} = 24.3cm$ ***(4 marks)***

2.

Substance	**Food substance being tested**	**Procedure**	**Observation**	**Conclusion**
S	Protein.	To 1 ml of food substance add equal amount of sodium hydroxide. Add a few drops of copper sulphate solution dropwise. Shaking after each drop.	Purple violet colour.	Protein present.
T	"	"	No colour change/ blue colour.	Protein absent.
U	"	"	Light pale purple colour	Trace protein present.

(9 marks)