231/2 BIOLOGY (2018)
PAPER 2*(Theory)*
MARKING SCHEME

a) B-Humerus; C-radius

b) Sigmoid notch;

c) Ball and socket

d) Prevents drying out of organism (desiccation);

Controls size of the organism
- Provides protection against microbial infections and mechanical injury
Provide surface for muscle attachment

e) Expose the large surface area of leaf to trap sun light for photosynthesis
Ensure flowers are exposed to pollination
Expose fruits and seeds to disperse
To resist breakage (due to their own weight and that of the organism).

2. (a). osmosis
(b). solution A was hypotonic to cell sap; cortical cells gained water by osmosis; and became turgid since epidermal cells have cuticle; which restricted osmosis the piece curved outwards;
(c). metabolic poison affects respiratory enzymes; blocking energy production hence energy for active transport.
(d). cell wall

3. (a) C- endomentrium
D—cervix
(b). oestrogen, progesterone.
(c). have cilia which wafts to propel the ovum.
Have smooth muscles that contract to push the ovum toward the uterus
Have mucus to make easy the movement of the ovum.
Funnel shaped top to receive the ovum
(d). A
(e). causes contraction of uterine wall to expel the foetus
Causes contractions of alveoli pushing milk into lactiferous ducts

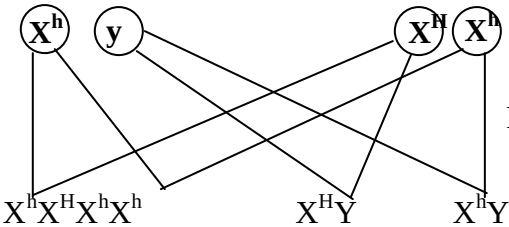
4.(a) male X^hY ; female x^Hx^h

(b)(i)

phenotype ♂Haemophilia male ♀Normal female

Genotype X^hY X X^HX^h

Gametes



Fusion

F1Offspring $X^hX^HX^hX^h$ X^HY X^hY

(ii) Jenifer; $\mathbf{x^h x^h}$

(c) A condition/phenomenon where a cell or an organism has an extra set of chromosome;

5. (a)(i) Gall bladder
(ii) Stores bile used in emulsification of fats
(b) As an endocrine gland K (pancreas) produces insulin and glucagon hormones;
As an exocrine gland K (pancreas) produces digestive enzymes.
(c) (i) P(stomach) has gastric glands that produces acidic juice making chyme to be acidic; H(gall bladder) produces bile salts drained into duodenum to neutralize acidic chyme; K(pancreas) produces sodium hydrogen carbonate ($NaHCO_3$) that neutralizes acidic chyme from stomach
(ii). Secretin

6.a)

b)
(i) Carbon (iv) oxide consumed.
Photosynthesis
(ii) Carbon (iv) oxide released.
Respiration;

c)(i) Carbon (iv) oxide consumed.
Rate of carbon (iv) oxide consumption increases from 6 hours to 12 hours, due to increase in light intensity, The rate remains higher between 12 and 14 hours which is the period of optimum light intensity, after which rate of consumption decreases due to decrease in light intensity; 4points max.

(ii)Carbon (iv) oxide released.
Rate of carbon (iv) oxide released decreased from 6 hours to 12 hours; Some were used up for photosynthesis; from 14 hours to 20hours the rate of carbon (iv) oxide released increased due to

decrease in rate of photosynthesis / reduced light from ,rate remains constant from 20 hours since photosynthesis is not taking place / no use of carbon(iv) oxide; 4 points max.

d) (i)
Point at which rate of photosynthesis equal rate of respiration / amount of carbon (IV) oxide used is same as amount of carbon (IV) oxide released.
(ii) From the graph, time of day when the plants attained compensation point was 7.2; 17.5; hours

e) Increase in temperature increase the rate of carbon (IV) oxide consumption /up to optimum point);
Further increase reduce rate of carbon (IV) oxide consumption as enzymes are denatured;

7. (a)-Highly vascularised/network of blood capillaries;
- Large surface area for gaseous exchange;
- Thin membrane/ epithelium/ one cell thick wall/ thin lining;
- Moist (lining);
(4mks)

(b) Breathing in:
-External intercostal muscles contract; internal intercostal muscles relax;
lifting/raising the ribcage upwards and outwards; muscles of diaphragm contract; hence it flattens; the volume of the thoracic cavity/lungs increases; while the pressure decreases; higher air pressure in the atmosphere forces air into the lungs(through nose);
Breathing Out:
-External intercostal muscles relax; while internal intercostal muscles contract;
moving the rib cage downwards and inwards; the muscles of diaphragm assumes dome shape; the volume of thoracic cavity decreases; while pressure increases; High pressure forcing air out of the lungs(through nose); (l6mks)

8. a) Describe how fruits and seeds are adapted to water and wind dispersal. (10marks)
Water dispersal
- Mesocarp/seed coat trap air bubbles which make them buoyant; they float on water therefore carried away from parent plant;
- In some fruit pericarp/seed testa are waterproof; this enables them to float on water without soaking and sinking during dispersal;
- Some are light so as to float on water;
- Some have fibrous and spongy mesocarp that traps air bubbles;
Wind dispersal
- Censer mechanism; some fruits are capsule shaped and are loosely attached to stalk/the long stalk is swayed by wind scattering seeds;
- Presence of long hairs/wing-like structures/floss/extensions which increase surface area/for buoyancy; Making it easy for fruits/seeds to be blown away; fruits/seeds are light due to small size; therefore easily carried away by wind.

(b) 8) INSECT POLLINATED (entomophilus) (10mks)
Are scented to attract insects; Have sticky stigma for pollen grains to stick on; Brightly coloured to attract insects; presence of nectar to attract insects; Have nectarines to secrete nectar; Have nectar guides to guide the insect to the nectarines; stigma/anthers located inside the flower/tubular/funnel shaped to increase chances of contact by insects; sticky/spiny pollen grains which stick on the body of insect and on stigma, large/conspicuous flowers easily noticed by insects; Anthers firmly

attached to filament for insect to brush against them; Have landing pad to ensure contact with anther and stigma;