BIOLOGY PAPER 2 YEAR 2018

MARKING SCHEME

Q1. (a) (I) A:Renal vein;

(ii) B: Pelvis;

(b) (i) (Loop of Henle) it would be long in a desert rat while short in a fresh water fish;

(ii) Antidiuretic hormone hormone; (No Abbreviation)

(c) A – would have a higher/lower concentration of oxygen/ carbon (IV) oxide than E; (Accept the converse)

-Blood in A would be at a higher pressure than blood in E

(d) Excretion; osmoregulation;

Q2. (a) (i) Ribonucleic Acid ;(reject abbreviations)

(ii) It has Uracil; (base) which is absent in DNA

(iii) (Accept whether facing up or down);

(b)

RNA	DNA
(i) Has ribose sugar;	Has Deoxyribose sugar;
(ii) Single stranded;	Double stranded;
(iii) Has Uracil;	Doesn't have Uracil;
(iv) Found in nucleus and cytoplasm;	Confined in Nucleus;

(NB: Mark the first two)

(c) Insertion; Deletion; substitution; inversion;

(Mark the first two)

(d) Increased yields;

Early maturity;

Resistance to drought/pests/diseases; (NB: mark the first one)

Q3. (a) (i) Protogyny- situation where the carpel matures before the stamens of the same flower;

Protandry- stamens mature before carpel of the same flower;

(ii) Asexual reproduction- there is no fusion of the male and the female gametes;

Sexual reproduction- there is fusion of the male and female gametes (to form a zygote);

(b)- Cannot occur where the gametes of the two parents do not meet;

-Undesirable characteristics may emerge as the generic make up of the offspring is not identical to the parent.

(c)- Seminal vesicles;

-Cowper's gland;

-Prostate gland; (NB: Mark the first two)

Q4. (a) A- Radius;

C- Humerus;

(b) (i) Muscle Y relaxes; and the hand bends;

(ii) skeletal/striated (muscle); straight; voluntary;

(c)- has socket/glenoid cavity/ has cartilage/ smooth surface to reduce friction;

- Hard to provide support to the skull/cervical vertebra/ and forelimbs;

- Broad (flattened) to increase surface area for attachment of shoulder muscles;

- have a cromion/metachromion to increase surface area for muscle attachment;

(d) P- ball and socket – allows movement in all planes/ at 360° while Q allows movement in one plane/180^{0};

Q5. (a) (i) Phytoplankton; (ii) Hawk;

(b) Phytoplankton ⟶ Snails ⟶ hawk;

(c) Zooplanktons would increase due to decreased predation;

Water snails would decrease due to lack of food (competition);

(d) Oil prevents dissolving of oxygen in water hence fish die due to suffocation/ Oil clogs fish gills;

(e) Domestic waste and sewage; silting; industrial effluent; agricultural chemicals;

Q6. (a)To investigate energy (heat) production in germinating seeds

(b) 33.5^0C;

(c) (i) 0 to 2 days:

R- Temperature kept increasing/rising rapidly; sharply; since seeds were germinating steadily; and respiring to produce energy (heat);

T- The temperature remained constant; since the seeds were boiled dead and not respiring;

(ii) After 5 days

R- Temperature reduced slightly; rate of respiration was high during germination; after which seedling respires moderately;

T- The temperature begun to rise fast/rapidly; decomposition; led to production of more heat energy;

(d) S seeds were killed by boiling; then treated with disinfectant ensuring no growth of micro-organisms; no respiration occurred;

(e) (i) By use of vacuum flasks in place of flasks; this will prevent loss or gain of heat;

(ii) Control experiment;

(f) In the refrigerator the temperature is too low; and any micro-organisms are made inactive;

Q7. (a)Highly folded/ branched to increase the surface area for gaseous exchange;

Dense network of capillaries for the transportation of respiratory gases;

Have a ventilation mechanism to supply fresh air;

One cell thick epithelium (accept thin) to reduce diffusion distance;

(b)

- Lenticels;
- Stomata;
- Epidermis of young root;
- Breathing roots/pneumatophores;

NB: mark first two

(c) Spiracles have muscular valves; that control opening and closing of spiracles;

Opening of spiracles has a tuft of hairs; to prevent loss of water from body tissues by evaporation;

Spiral bands of chitin on trachea; prevent it from collapsing/maintains its shape/ keep it open;

Tracheoles are branched at the tips; to increase surface area for gaseous exchange;

Absence of rings of chitin on tracheoles; to permit more gaseous exchange through them;

Tracheoles have tracheolar fluid (at the tips): for dissolution hence diffusion of respiratory gases;

Tracheoles are in direct contact with body tissues; to reduce diffusion distance; hence faster exchange of respiratory gases;

Q8 (a) (i) Exposes the leaves in position to maximize light absorption/photosynthesis;

(ii) Enables roots to seek for water;

(b)

Endocrine system	Nervous system
Chemical substance to evoke a response	Nerve impulse to evoke a response;
Chemical transmitted through blood	Impulse transmitted through nerve fibre;
Responses are slow but affects several parts of the body	Responses quick, specific and localized;
Effects are long lasting	Effects rapid and short lived;

Nb. Mark first three.

(C)

Cerebrum;	-integration of sensory impulses; e.g. vision/hearing/taste; -Association related to memory; -Voluntary control of body movements of limbs/lips/neck; -Frontal area is responsible for human individuality; character; imagination; and intelligence;
Corpora quadrigemina;	-Relays impulses to the forebrain; -Influences control of movement; posture;
Cerebellum;	-Co-ordination of body movements; -Maintenance of balance and posture; -Dexterity in fine movements;
Medulla oblongata;	-Controls involuntary movements; e.g. respiration/blood circulation/ swallowing/salivation/vomiting;
Hypothalamus;	Controls body temperature; and osmoregulation. Sleep/wakefulness; feeding/drinking;
Thalamus;	Integrate sensory impulses from eyes, ears and skin;
Optic lobes;	Responsible for eye movements;
Pituitary gland;	Control hormonal secretion by other glands;

(30 max. 15 marks)