STAREHE GIRLS' CENTRE MOCK EXAMINATION 2025

BIOLOGY

Paper 2

MARKING SCHEME

SECTIION A

1. (a) Sodium ion

Diffusion, because it's uptake occurs according to the concentration gradient:

(ii) Iodine ion

Active transport; its uptake occur against a concentration gradient

(b) Iodine; its uptake depends on energy derived from ATP;

c) This is because fresh water fish would lose water molecule; to the marine habitat since the marine environment is hypertonic;

2 (a) Primary consumers;

(b) Predation/feeding;

(ii) decomposition/decay/predation; *reJ rotting*

(ii) Absorption

(c) Decomposers /bacteria/ fungi/ saprophytes;

(d) Primary consumers/ organisms in box 0_2 will increase in numbers; leading o overgrazing decreasing in number of producers; which lead to reduction in numbers of primary consumers;

3 (a) Non disjunction is a condition in which chromosome fails to separate at anaphase 1 of meiosis leading to addition or loss of a chromosome:

(b) . (i) Parental phenotype: normal man currier woman

Phenotype: 2 normal females: normal male: hemophilic male:

All normal female; currier female: normal male: /hemophilic male

(ii) Kinefelters, torners and dorn syndrome: ***any two***

(c) Colour blindness and hairy pinna/ nostril/ porcupine skin in males *(any one)*

4 (a) The coleoptice tip bends towards light (show positive phototropism) Light causes lateral migration of auxins from the lit side of the shoot to the darker side: high concentration of auxins on the darker side stimulates rapid cell elongation and hence faster growth rate at the darker side

(b) –B and C acts as a control experiments

B-shows that it is the tip that responds to light

C-Shows that it is the tip that is the source of growth hormones:

(d) Hormones from the tip do not reach region of cell elongation due to mica blade;

E -The shoot curves because mica blade does not interfere with the movement of auxins hormones from the region of cell elongation on the side away from the light

5 (a) A- Cornified layer

B- Sebaceous gland

(b) (i) Hair raised trapping air between hair and the body air is a bad conductor of heat insulates the body against heat loss:

(ii) Vasoconstriction- less flows to the skin less head lost

-Metabolic rate increase heat production;

-Shivering un involuntary contraction skeletal muscles to generate heat;

SECTION B (40MKS)

6(a) Plotting (2mks)

Scale 2mks)

Axis labelling(1mk)

Identify curves (2mks) *reg marks for if origin is missing /upper limit*

b)Rate

Still; 1.4 per m^2 per hour;

Wind ; 6.0 per m^2 per hour

(c) As width of the stomata increases the rate of transpiration increase;

Increase in the width of the stomata increases the surface area over which water loss by transpiration occurs; hence increasing the rate of transpiration

d) In still air the water vapour lost from the plant accumulates in the air surrounding the leaf; thus increasing humidity; which reduces saturation deficit between leaf cells and the atmosphere hence reducing transpiration rates,

In wind; the water vapour being from the plant(shoot) is carried away from the surrounding of the plant; increasing the saturation deficit between leaf cells and the surrounding air; thus reduce rates of transpiration;

(e) -Evaporation of water from the leaf surface causes cooling of the plant:

-Facilitates loss of excess water from the plant excretion;

-Concentrates mineral salts around the roots facilitating their easy, uptake by diffusion;
-Facilitates turgidity of plant cells hence support in herbaceous plants;

7. Describe the various ways in which seeds and fruits are adapted for dispersal
-Some fruits have dry pericarp/ pods with lines of weakness/softness; which splits open and forcefully dispersing the seeds;
-Some fruits /seeds being small in size/ light in weight reduce their density and float in air;
Some seeds/ fruits have hooks so that they may cling to animals bodies for as they pass;
-Some fruits have thick fibrous walls with air pockets; protecting seeds from absorbing water; enhancing floatation in water, transported to far off places;
-Some fruits seeds have floating devices / wings /harry parachute; to increase the surface area for buoyancy in air
-Some seed/ coat testa are resistant to enzymatic digestion in animal's digestion system
-Seed /coat impermeable to water; to allow seed to remain viable for a long period;
-Some fruits being succulent heshilly; to attract animals to feed on them;
-Fruits being brightly colopured; to attract animals to feed on them;

8. (i) Auxins
-Promote cell division/elongation/influence tropical movements;
-Promote fruit formation/parthenocarphy
-Promote formation of abscission layer bring leaf full;
-Causes apical dominance
-Promotes growth adventitious roots and lateral branches
-IAA and cytokinins induce formation of callus tissue during healing of wounds

(ii)Gibberellins/giberelic acid
-Promotes cell division/elongation in dwarf vanities,
- parthenocarpy initiale fruit formation
-Promotes formation of side branch end dormancy in buds:
-In hibit growth of adventitious roots
-Activates enzymes during germination break dormancy
-Affects leaf expansion and shape/ retard lead abscission;

b) Fossil records /paleontology

Fossils are remains of organisms that became preserved in naturally occurring materials many years ago; They show morphological charges of organisms over a long period of time **(max 3)**

Callparative anatomy;

Organisms have common embryonic origin; but structures become modified differently to perform different functions; those are called homologous structures other have different embryous origin but structures become modified and adapt in the same environments thus perform similar functions such structures are called analogous structures; others have become reduced in size dug to disuse in the environment; these are called vestigial structures ***(max 6)***

Geographical distribution

Presents continents are thought to have been one large land mess (pangea); as a result of continental drift; isolation occurred bringing about different patterns of evolution; of related organisms e.g. llamcis in the amazon resemble the camel;

Acc ;Jaguars ,panthecs with their counter parts etc ***(max 3***)