**231/1 BIOLOGY PAPER 1 FORM 4**

**MARKING SCHEME**

**Kenya Certificate of Secondary Education**

1.

|  |  |
| --- | --- |
| Plants | Animals |
| - Manufacture their own food  - most plants grow continuously throughout their life  - Slow in responding to stimuli  -do not move from one place to another | - Cannot manufacture their own food  - Stop growing when they reach maturity  - Fast in responding to stimuli  Moves from one place to another |

2. cell sap of the root hair cells is more concentrated in solutes/has less water than the soil solution.Thus water moves into root hair cell by osmosis i.e across the cell a wall and the semi permeable membrane.

(4mks)

3.

|  |  |
| --- | --- |
| Diffusion | Osmosis |
| * Involves movement of molecules of solid, liquid or gas. * It may be through a membrane liquid or in air. * Not affected by pH changes. | * + - * Involves movement of solvent       * It takes place through a semi-permeable membrane.       * Rate affected by pH changes. |

4. (a) (i)Entomology

(ii)Sap vacuole - store sugars (in plants) contribute to the osmotic properties of the cell

(b) Manufacture ribosomes.

5. Sensitive to change in temperature; pH;

Has electrical changes,/ positive and negative changes;

Selectively permeable;

6. (a) Volume increases, pressure decreases; rises upwards and (slightly) outwards;

(b) Flattens

(c) Contracts

(d) Relaxes

7.(i) Anaphase I

(ii) Homologous chromosomes separate at the equator.

Chromosomes start migrating to opposites poles.

Sister chromatids attached at the centromere.

iii) Spindle fibres

8. Pinna: It collects and concentrates sound waves to the auditory meatus.

Tympanic membrane: thin tough membrane that transforms sound waves into vibrations.

Vestibule – Consists of utriculus & Sacculus that have sensory cells. Maintains body balance & posture in relation to gravity.

9 a). Why Lamarck’s theory is not accepted

- acquired characteristics are not inherited.

- Inherited characteristics are found in reproductive cells only.

b) Fossils, records, (Palaeontology)

- Geographical distribution comparative anatomy/taxonomy cell biology

- Comparative serology,

- Comparative embryology

- Comparative immunology

10.(a) it ensures that blood flows out of the heart to all parts of the body to supply of nutrients and oxygen to the cells and removal of waste products of metabolism from the body cells

(b) Ans. The rhythmic contractions of the heart arises from within special cardiac muscles/the heart muscles are myogenic;

11.(a) Ans. *Salmonella typhi;*

(b) Ans. *Treponema pallidum;*

12.(a) Ans. To show that oxygen is necessary for germination;

(b) Ans. No germination in A; germination occurs in B;

(c) Ans. Pyrogallic acid absorbed all the oxygen necessary for respiration/lacked energy for growth;

13.(a) Have biconcave disc shape which increases the surface area for exchange of gases by diffusion;

* Have haemoglobin which has high affinity for oxygen; (hence faster transportation of oxygen).
* Lacks nucleus to provide more room for packaging of haemoglobin.
* Have thin plasma membrane that allows faster / rapid diffusion of gases
* Have carbonic anhydrase which accelerates loading and off-loading of carbon (IV) oxide for faster carbon (IV) oxide

transport. (any three) (3 marks)

(b) - Carbamino haemoglobin;

- Carbonic acid;

Bicarbonate ions (1 mark)

14.(a) - Collenchyma;

- Scherenchyma;

- Xylem;

- Tracheids; (any three) (3 marks)

Turgid parenchyma cells

(b) Smooth muscles/visceral;

15(a) Fruit formation without fertilization having taken place; (2 mks)

(b) Auxins; (2 mks)

Gibberellins;

16a) i) Hypo secretion of Insulin (1 mk)

ii) Hypo secretion of Antidiuretic Hormone (1 mk)

b) Take urine sample from the patient. Put it in a test tube and add Benedict’s solution; boil the mixture and if and orange precipitate forms then he/she is positive (3 mks)

17. Mg = Length of diagram = 3cm

Real length 6cm =X 0.5

18.a) A-epidermal cell

B- guard cell

b) Has chloroplast to carry out photosynthesis

Has thicker and less elastic inner walls and thinner and more elastic outer walls to allow bulging out when turgid opening the stomata

19.Nicotine

Mild stimulant

Quinine

Treatment of malaria

20.

1. Mouth modified to a beak
2. Forelimbs modified to wings
3. Covered with feathers
4. Legs covered with scales

21.(a) Long sightedness / Hypermetropia (Acc. Long sight)  
 (b) Convex lens / converging lens; to converge the rays so that the image focus on the retina.

22 a. -untreated sewage

-Agrochemicals

-industrial and domestic effluents

-oil spillage

-heavy metals

-soil erosion

Any two correct (2mks)

b. mark as per causes – mentioned in 11 (a) reject others.

|  |  |
| --- | --- |
| Cause | Control |
| 1. Untreated sewage | * Treatment and proper disposal of sewage. |
| 1. agrochemicals | * use right amount of fertilizes * use of organic manures * Use of biological control. |
| 1. Industrial and domestics effluent | * Proper disposal |
| 1. Oil spillage | * Use of pipeline to transport oil * Service of ships |
| 1. Soil erosion | * Control by terracing, crop rotation construction of gabions, planting cover crops trees |

(2mks)

23 a) B- coleoptile (1mk)

D-Radicle (1mk)

b) A and F (2mks)

24.(a) Whether oxygen is produced during the process of photosynthesis;

(b) Using a glowing splint; when the splint is inserted into test tube it is relighted;

(c) To produce carbon (IV) oxide;

(d) Presence of sunlight;

Optimum temperature; any one factor