



Subject: Grade 10 Life Sciences

Topic: Life Sciences: Term 2 - Exam 1

Total: 159 Marks

1. eutrophication | eutrophication.

3 marks

Explanation:

People use **fertilisers** to add minerals to the soil, but during heavy rains, these fertilisers are **leached/washed away** into **rivers and dams**.

This causes an increase in algae growth, called **algal bloom**. This algae blocks the sunlight from entering the water, resulting in the **plants dying** because they cannot photosynthesise.

This will lead to the **death of fish and other water organisms** as there is **no more oxygen and food**.

2. D: Growth

4 marks

Explanation:

The main functions of the leaves are:

- Trapping sunlight for **photosynthesis**.
- Allows **gaseous exchange** to take place through the stomata.
- **Transport** water and nutrients.

3. pith | pith. | ground tissue | ground tissue.

3 marks

Explanation:

The structure found in the centre of the stem is called the **pith**.

The pith consists of **large thin-walled parenchyma cells** that have large intercellular air spaces.

4. B: Metaphase

4 marks

Explanation:

The chromosomes arrange themselves on the equator during **metaphase** in mitosis. The **spindle fibres** will then **attach to the centromeres** in preparation for anaphase to take place.

5. true

2 marks

Explanation:

Macro means large and therefore macroelements are needed in large quantities.

Some examples of macroelements are calcium, phosphorus, sodium and potassium.



Explanation:

Here are the minerals that all have deficiency diseases in humans:

Mineral

Deficiency disease

Calcium

Rickets - soft, flexible bones that occur in children

Sodium

Muscle cramps

Iron

Anaemia - lack of red blood cells

Iodine

Goitre - enlarged/swollen thyroid

7. palisade | palisade.

3 marks

Explanation:

The **palisade** mesophyll cells contain the **most chloroplasts** as they are located directly under the upper epidermis, this allows them to **absorb the most amount of sunlight** for photosynthesis to occur.

8. grows • replaced • repaired

8 marks

Explanation:

Mitosis has a few important functions to play in cells:

- New cells ensure that the organism **grows** and increases in size.
 - New cells ensure that dead cells are **replaced** and damaged cells are **repaired**.
 - It results in the **reproduction** of simple organisms.
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9. cytokinesis | cytokinesis.

3 marks

Explanation:

Cytokinesis is the division of the cytoplasm, organelles and cell membrane.

This process happens during **telophase** in mitosis where one cell divides into two cells.

10. false

2 marks

Explanation:

In animal cells, **invagination** occurs during cytokinesis to create two daughter cells.

In plant cells, a **cell plate** forms during cytokinesis to create two daughter cells.

11. chemotherapy | chemotherapy.

3 marks

Explanation:

One of the treatments for cancer is **chemotherapy** which uses **various chemicals** to **destroy** the cancer cells.

This type of cancer treatment works by keeping cancer cells from **growing, dividing, and making more cells**. Chemotherapy can be used as a treatment for many different cancers.

12. B: Guttation

4 marks

Explanation:

The phenomenon is called **guttation**, where **water droplets** are forced out of the plant through small openings on the **edges of the leaves**.

This happens when the **plant absorbs more water** and at a **faster rate** from the soil than what it loses water through transpiration.

13. B: 24

4 marks

Explanation:

During mitosis, the number of **chromosome number never changes**.

If a mother cell starts with 24 chromosomes, it will end with 24 chromosomes in each daughter cell.

14. false

2 marks

Explanation:

Diffusion is the movement of **gas molecules** from a high concentration to a low concentration until equilibrium.

Osmosis is the movement of **water molecules** through a **semi-permeable membrane** from a high concentration to a low concentration until equilibrium.

15. A: A

4 marks

Explanation:

The enzyme that would be found in the stomach is **A**. This is because the **optimum pH** for enzyme A is 2 and the **stomach** is the only body part that functions at such an **acidic pH**.

16. A: Metastasis

4 marks

Explanation:

A **malignant tumour** would start to grow and spread between the cells of the tissues, these cells then **spread via the circulatory system** to other parts of the body. This is when the cancer has **metastasised**.

17. false

2 marks

Explanation:

The instrument used to measure the rate of **transpiration** in plants is a **potometer**.

A simple potometer is a piece of capillary tubing to which a plant has been connected. The **water uptake** is measured by recording the time taken for a **bubble** in the tube to move a set distance.

18. mineral salts • roots • urea

8 marks

Explanation:

One of the functions of water is it acts as a **solvent**:

Mineral salts in the soil dissolve in water so that the **roots** of the plant can absorb them.

Oxygen and **carbon dioxide** must be dissolved in water before they can enter or leave animal cells.

Metabolic waste products, like **urea**, also dissolve in water.

19. false

2 marks

Explanation:

Wilting is caused when the **plant loses more water** through transpiration than the roots of the plant can absorb.

The **decreased turgor pressure** within the vacuoles makes the stems and leaves appear soft and wilted.

20. centromere | centromere.

3 marks

Explanation:

A chromosome consists of **two chromatids** and is held together by a **centromere**.

Chromosomes become visible during **interphase**, just before the cell goes into mitosis.

21. blue-black • starch • Iodine solution

8 marks

Explanation:

In the food test in the diagram, the potato turned a **blue-black** colour, meaning it tested **positive** for **starch**. The indicator used for this test is **iodine solution**.

If this test is done on something that **does not contain starch** it will stay a **yellow-brown** colour.

22. false

2 marks

Explanation:

A flowering plant consists of many different plant organs - **roots, stems, leaves, flowers, fruit and seeds**. Each of these organs is specialised (in terms of structure) to perform a specific function.

23. Decreased

8 marks

Explanation:

The following factors will increase the transpiration rate in plants:

- **Increased** temperature.
 - **Increased** light intensity.
 - **Decreased** humidity.
 - **Increased** wind.
-

24. C: C

4 marks

Explanation:

A deficiency in **vitamin C** can cause **scurvy**. Scurvy is when your gums start to bleed, wounds don't heal and internal bleeding occurs.

Vitamin C is found in citrus fruits, tomatoes, guavas and leafy green vegetables.

25. true 2 marks

Explanation:

Water has many functions and one of them is to **regulate body temperature**. This is done by **sweating** on warm days, which evaporates and cools down the body.

26. carbon | carbon. | C | C. 3 marks

Explanation:

The element **carbon** is the difference between organic and inorganic compounds.

- Organic compounds are chemical compounds that **contain carbon**.
 - Inorganic compounds are chemical compounds that **don't contain carbon**.
-

27. true 2 marks

Explanation:

The diagram depicts the **root** of a plant.

A visible reason for this is the **root hairs** that can be seen protruding from the sides of the root.

28. Substrate • Active site • Enzyme • Product 8 marks

Explanation:

The lock-and-key model of an enzyme:

- A - Substrate.
 - B - Active site.
 - C - Enzyme.
 - D - Products.
-

29. true 2 marks

Explanation:

Excessive use of **saturated fats** can lead to **high levels of cholesterol** in the blood and this can cause many health problems.

Atherosclerosis is the **narrowing of the blood vessels** due to fatty deposits (plaque) building up.

30. vein | vein. | vascular bundle | vascular bundle. 3 marks

Explanation:

The thick middle part of the leaf is known as the **vein** and it consists of **xylem and phloem**.

The **xylem** is responsible for the transport of **water** in the plant.

The **phloem** is responsible for the transport of **nutrients** in the plant.

31. chromatin network | chromatin network.

3 marks

Explanation:

Chromosomes appear in the form of a **chromatin network** for most of a cell's life.

The only time when chromosomes are visible is when the cell is going through mitosis. The chromatin network starts to **condense to form chromosomes**.

32. Cuticle • Stomata • Guard cells • Spongy mesophyll

10 marks

Explanation:

The labels for the leaf diagram:

- 1 - Cuticle.
 - 4 - Stomata.
 - 5 - Guard cell.
 - 6 - Spongy mesophyll.
 - 7 - Palisade mesophyll.
-

33. 3 • 2 • 5 • 4

10 marks

Explanation:

The correct order for the phases in the cell cycle from the diagram is:

- 3 (Interphase)
 - 2 (Prophase)
 - 5 (Metaphase)
 - 1 (Anaphase)
 - 4 (Telophase)
-

34. false

2 marks

Explanation:

Cancer is caused by **uncontrolled mitosis** in the body.

A group of cells is formed that have lost their original function and keep on dividing forming a mass of cells called a **tumour**.

35. false

2 marks

Explanation:

Plants absorb mineral salts through their roots from the soil.

Animals and humans absorb mineral salts from the **food they eat and the liquids they drink**.

Depending on the food that is consumed what the mineral salts will be absorbed. For example, bananas are high in potassium.

36. A: Glycogen

4 marks

Explanation:

Poly means many or lots. A polysaccharide is a long chain of monosaccharides that bind to one another. There are three types:

- Starch
- Glycogen
- Cellulose

37. D: Karyokinesis (division of the nucleus)

4 marks

Explanation:

During **interphase** the following needs to take place:

- Growing of the cell
- Replication of DNA
- Preparation for mitosis

Interphase is only included in the cell cycle and not in mitosis which consists of four phases. Interphase is the **period between cell division** and is vital for the cell to perform all life functions.

38. A | A.

3 marks

Explanation:

Side A shows a positive result for the lipid test.

The lipid test is done by putting a solution on **filter paper** and waiting for it to dry, if there is an **oily/greasy stain** left behind the solution tested positive for lipids.

39. hydrostatic | hydrostatic. | hydrostatic skeleton | hydrostatic skeleton.

3 marks

Explanation:

Jellyfish and earthworms have **hydrostatic** skeletons.

Water is vital for these organisms as it provides them with their distinct shapes and aids them in movement.

Total: 159 Marks