



Subject: Grade 11 Life Sciences

Topic: Life Sciences: Term 1 - Mini-Exam

Total: 128 Marks

1. D | C | B | A

8 marks

Explanation:

Plants that reproduce using seeds but not fruit are **gymnosperms**. This includes cycads and pine trees. This is shown by picture **D**.

Plants that have a thallus, meaning no true roots, leaves or stem, are **byrophytes**. This includes mosses and liverworts. This is shown by image **C**.

Plants that do have vascular tissue (xylem and phloem), but do not use seeds to reproduce are **pteridophytes**. This group includes all ferns, that reproduce using spores produced in sporangia. This is shown in image **B**.

Plants that have either wide adventitious or deep tap roots, and reproduce using seeds inside fruit are **angiosperms**. Any flowering plant is an angiosperm, and is shown by image **A**.

2. false

2 marks

Explanation:

Although it is true that fungi do not have true roots, the main vegetative mass is known as the **mycelium**. The mycelium is made up of a network of fibres called **hyphae**.

The hyphae are the thread-like structures that make up the mycelium mass.

3. B: White sores on the tongue and mouth

4 marks

Explanation:

A persistant cough that does not go away is a sign of **tuberculosis**. This bacterial infection primarily affects the lungs of an individual.

Anemia caused by the loss of red blood cells can be caused by **malaria**. The *Plasmodium* parasite destroys red blood cells as part of its life cycle. Anemia can be caused by other factors.

Dry and flaky skin is caused by a fungus, which is similar to thrush, but it is a different fungus. This is a symptom of **athlete's foot**.



4. C: Saprotrophic

4 marks

Explanation:

Fungi are not part of the kingdom Plantae, and do not contain chloroplasts. This means they **cannot photosynthesise**. Fungi are not autotrophic.

Symbiosis refers to a close relationship between two organisms, not a feeding habit. Many fungi are involved in symbiotic relationships, but this does not describe their feeding mechanism.

Fungi feed on **dead or decaying organisms**. This makes them **saprotrophic** organisms. This is a subdivision of heterotrophic, a more specific form of how they gain nutrients.

5. true

2 marks

Explanation:

Mutualism is a symbiotic relationship where both organisms benefit from the close relationship.

E. coli is a bacteria that lives in the large intestines of humans. As part of this relationship, the bacteria **gains nutrients** from the humans. Specifically, the undigested food we do not have access to, so they are not stealing food from us or harming us. In return, humans **gain vitamin K** as a by-product of this breakdown. Vitamin K is important for blood clotting.

Therefore, this is an example of mutualism.

6. B: They contain true roots, stems and leaves.

4 marks

Explanation:

Angiosperms reproduce using seeds contained inside fruit. Gymnosperms have 'naked' seeds.

Byrophytes absorb water directly through their leaves since they have no waxy cuticle. Gymnosperms absorb water in their roots that travel up the xylem.

Pteridophytes have their stems grow horizontally as rhizomes. Gymnosperms grow vertically.

7. chordata

3 marks

Explanation:

The organism in the image is a fish. This fish:

- has bilateral symmetry
- has cephalisation
- is coelomate
- is triploblastic
- has a through-gut
- is a vertebrate with a notochord

This makes the fish part of the phylum **chordata**.

8. false

2 marks

Explanation:

The ovary/ovule is the site for **fertilisation**. This is the place where the male and female gametes of the flower will fuse to form the zygote.

The site of pollination is the **stigma**. The sticky nature of the stigma allows transferred pollen to stay in place for the pollen tube to grow down to the ovary.

9. false

2 marks

Explanation:

Fungi do not contain chloroplasts or chlorophyll. They cannot undergo photosynthesis.

Fungi are saprotrophic, feeding on dead/decaying matter for an energy source.

10. B

3 marks

Explanation:

The structure of the flower that produces the male gamete is the **anther**.

In this image:

- A is the ovary/ovule
- B is the anther
- C is the stigma
- D is the style

11. slime layer | slime capsule | waxy layer | waxy capsule

3 marks

Explanation:

The bacterial cell has 3 outer sections.

Label C shows the innermost section which is the **cell membrane**.

Label B is the middle section which is the **cell wall**.

Label A is the outermost section which is the **slime layer** (also known as the **waxy capsule**)

12. D: The immunity present at birth is known as natural immunity.

4 marks

Explanation:

The **primary response** involves the body creating an inflammatory response as well as increasing body heat. This is a non-specific response that aims to deal with a variety of pathogens. The secondary immune response is a **specific response**. This is where white blood cells fight a specific pathogen.

The three main categories of white blood cells are phagocytes, T-lymphocytes and B-lymphocytes. Examples of T-lymphocytes include **CD4 cells and Killer T-cells**.

The protein markers found on pathogens are called **antigens**. Antibodies are produced by B-lymphocytes to combat pathogens.

Babies are born with a **natural immunity**. The mother's antibodies are passed on to the baby to help protect it for the first few months of life.

13. triploblastic | pseudocoelomate | ectoderm | endoderm | body cavity | mesoderm

12 marks

Explanation:

We can clearly see there are **three layers** to this organism. A mesoderm is visible in label D. This means the organism is **triploblastic**.

The body cavity of this organism is **not surrounded by the mesoderm**. This means it is **pseudocoelomate**. A coelomate organism has a body cavity surrounded by the mesoderm.

Label A is the outermost layer, known as the **ectoderm**. Label D is then the middle layer, known as the **mesoderm**. Label B is the innermost layer, known as the **endoderm**. The **body cavity** is shown by label C.

14. vector

3 marks

Explanation:

Using a mosquito as an example, they can carry the protist *Plasmodium* inside their bodies. The mosquito is not affected by the *Plasmodium*, but it can pass the protist on to another organism (like humans).

The *Plasmodium* is then able to infect humans and cause malaria.

The mosquito in this example is therefore a **vector**.

15. false

2 marks

Explanation:

Pteridophytes are the phylum of plant that has been described.

Gymnosperms can have either adventitious or tap root systems and can reproduce using seeds. The leaves of gymnosperms are thin, pine needles instead of fronds.

16. filament | ovule | sepals | stamen

8 marks

Explanation:

The blue label lines represent the **male** section of the flower which is the **stamen**. This consists of label 1, which is the anther and label 2, which is the **filament**.

The pink label lines represent the **female** section of the flower which is the **carpel**. Label 3 is the stigma; label 4 is the style; label 5 is the ovary; and label 6 is the **ovule**.

Labels 7 and 8 are accessory structures that assist the flower to perform its function. Label 7 is the petals and label 8 is the **sepals**.

17. weak | B | antibodies | acquired

8 marks

Explanation:

Vaccination is a **preventative** measure. This is not used to treat an individual who is sick, but rather to prevent them from getting infected by pathogens.

To achieve this, a **weak** version of the pathogen is injected into the individual. It must be weak so that the individual does not actually get the sickness when exposed. The body only needs to recognise a new pathogen to develop a defense. There is no need to have the full blown sickness for this to work.

Once identified, the **B-lymphocytes** will begin to produce **antibodies** that will fight off the pathogen. This is a safer method, as the body has time to get the right formula of antibody without the individual being harmed by the illness. Antigens are the protein markers found on the actual pathogen themselves. They are what identify the pathogen as foreign to the body.

Once the pathogen is destroyed, the individual will have a much stronger and quicker response should they get infected with the actual pathogen. Thus, they are protected from the infection. This is an example of **acquired immunity**, as the body had to learn how to fight off this new pathogen. Natural immunity is present from birth, and is the more generic response to simple pathogens.

18. D: 2, 4 and 5 only

4 marks

Explanation:

Plants that are pollinated by birds must attract the bird specifically, and must also be able to support the bird without the plant breaking.

Large flowers are one way they achieve this. The bird must be able to see the flower and if they are too small, the bird will miss them.

Birds feed on the **nectar** produced in the flowers. Therefore, the more nectar they can produce, the greater the chance a bird will come to the flower and pollinate it. The bird has no use for pollen by itself.

To make sure the pollen attaches to the bird, the stamens and stigmas protrude beyond the petals. Some birds have long beaks to reach the nectar, and petals can get in the way. This also helps to reduce self-pollination.

Large amounts of pollen production and flexible stalks are both adaptations of **wind** pollinated flowers.

19. protista | protist | protists

3 marks

Explanation:

Algae can be unicellular or multicellular, but are all **eukaryotes**. They are also **autotrophic**, meaning they can photosynthesise.

However, algae do not have roots, leaves, stems, or any other major structures like plants. Therefore, they are not part of the kingdom Plantae.

This means they are part of the kingdom **Protista**

20. bacillus | bacilli | bacili | bacilus

3 marks

Explanation:

- Image 1 shows a circular bacteria. The scientific term for this is **coccus** (cocci for plural).
- Image 2 is a rod-shaped bacteria. The scientific term for this is **bacillus** (bacilli for plural).
- Image 3 shows a spiral-shaped bacteria. The scientific term for this is **spirallus** (spiralli for plural).

21. bacteria | virus | cell wall | cell wall | D | 3

12 marks

Explanation:

The image on the left is a **bacteria** cell. We know this since it is a single-celled organism that is more complex.

The image on the right is a **virus**. It is a more simple structure that does not contain the normal organelles of a cell.

The general bacteria has 3 layers. The inner most layer (label F) is the cell membrane. The next layer (Label E) is the **cell wall**. The outermost layer is the waxy capsule.

Label 4 of the virus is the layer that surrounds the genetic material of the virus. This is the **protein capsid**.

The flagellum is a long extension of the cell membrane that allows the bacteria that contain them to move. This is shown by **Label D**. There can also be smaller extensions surrounding the bacteria known as **pilli**. These help with attachment to structures and each other, and is shown by label A.

The genetic material of bacteria can **only be DNA**, whereas a virus can have **either DNA or RNA**. Therefore, **Label 3** can be either DNA or RNA.

22. A: Cnidaria

4 marks

Explanation:

The organism in the image is a sea anemone.

This organism has radial symmetry, no cephalisation, is diploblastic, acoelomate and does not have a through-gut.

This makes it part of the phylum **Cnidaria**.

23. D: Mycobacterium tuberculosis

4 marks

Explanation:

In the image, the disease is being transmitted through one individual coughing near another. This is therefore an **air-borne** disease.

Plasmodium is the cause of **malaria**, which is a vector transmitted disease through mosquitoes.

Vibrio cholera is the cause of **cholera**, which is a water-borne disease. Only through drinking contaminated water, or consuming infected human waste will the infection spread.

Human immunodeficiency virus is HIV, a mainly sexually transmitted infection. Only through the sharing of bodily fluids like **blood or semen** can this be transmitted, not by coughing on someone. Intercourse and sharing of needles are two of the most common ways this is transmitted.

Tuberculosis is caused by Mycobacterium tuberculosis, which is an air-borne disease.

24. true

2 marks

Explanation:

The organism in the image is a jellyfish (or medusa).

Jellyfish are aquatic organisms that have radial symmetry, no cephalisation, are acoelomate and have no through gut.

They are therefore classified as **Cnidaria**.

25. Bilateral symmetry | Yes | Triploblastic | Acoelomate

8 marks

Explanation:

Platyhelminthes are one of the main phyla in the kingdom Animalia. This group includes organisms like flukes, tapeworms (flatworms) and free-living planaria.

Platyhelminthes are dorsiventrally flattened, with a definite anterior, posterior, dorsal and ventral side. This makes them **bilaterally symmetrical**.

Their sense organs and nerve tissue are concentrated around the anterior portion of the body. This allows them to have a clearer sense of their surroundings to respond accordingly. Therefore, **yes**, platyhelminthes do have cephalization.

The embryos of platyhelminthes have an endoderm, ectoderm and a mesoderm. Therefore, they are **triploblastic**. They do not contain a body cavity that develops from the mesoderm, making them **acoelomate**.

26. true

2 marks

Explanation:

Arthropoda as a phylum includes all insects, crustaceans, arachnids and scorpions.

One of the defining characteristics of this phylum is the presence of an **exoskeleton**. This outer covering on the body made of chitin protects the internal structures of the organism while also facilitating movement. The exoskeleton does not grow with the organism, and many must shed their exoskeleton and form a new one when they grow bigger.

27. antibiotics | anti-biotics | antibiotic

3 marks

Explanation:

Bacterial infections are treated with **antibiotics**. These drugs target and kill bacteria which prevents the infection from spreading.

Antibiotics do not work on viruses and a person only takes them if they are infected, not as prevention.

28. A: **X** - Asymmetrical **Y** - Coelomate **Z** - Bilaterally

4 marks

Explanation:

Porifera include organisms such as sponges. These are the simplest animals and are **asymmetrical** and do not contain a coelom.

Annelida include organisms such as earthworms. They are bilaterally symmetrical and they do contain a coelom, along with a hydrostatic skeleton.

Arthropoda include organisms such as insects and shrimp. They are **bilaterally symmetrical** and do contain a coelom.

29. true

2 marks

Explanation:

Human immunodeficiency virus attacks the white blood cells of humans. In particular, they destroy the CD4 cells of humans. These are the cells that normally start an immune response. Without these cells, people who are infected with HIV can get sick very easily and die from secondary infections.

30. byrophyte | byrophytes | byrophyta

3 marks

Explanation:

The description shows plants that have no true roots, leaves or stems, as the body is a **thallus** (which could indicate either byrophyte or pteridophyte)

The gamete producing **gametophyte generation** is dominant (which indicates byrophyte), as opposed to the sporophyte generation (which could indicate pteridophytes).

Reproduction is both sexual and asexual (which could be either byrophyte or pteridophyte).

Therefore, the phylum in question is **byrophyte**.

Total: 128 Marks