

IGCSE Biology P1 V4 Key

Objective Section

Marks: 25

1. D
2. A
3. B
4. D
5. B
6. D
7. C
8. D
9. A
10. D
11. C
12. C
13. B
14. D
15. B
16. D
17. A
18. B
19. B
20. B
21. B
22. C
23. D
24. B
25. D

Theoretical portion

Marks: 45

1.

(i)

By using a potometer

- Obtain a healthy plant shoot and add oil on top.
- Set up a potometer with it and seal it tightly.
- Record water movement into a potometer.
- Calculate transpiration rate = water loss ÷ leaf surface area.
- Repeat for accuracy and analyze collected data.

(ii)

Exposure to a concentrated salt solution causes cell plasmolysis which shrinks the cell due to water loss by osmosis. This leads to a shriveled appearance in animal cells and a wrinkled appearance in plant cells.

(iii)

- | | |
|--------------------------|---------------------|
| • Growth spurts | • Less sun exposure |
| • Limited dietary intake | • Use of sunscreen |

2.

(i)

7.5 micrometers

(ii)

- | | |
|----------------------------|--------------------------------|
| • Damages the chloroplasts | • Cell damage and death |
| • Reduces photosynthesis | • Disturbs nutrient transport. |

(iii)

- **First Process:** Diffusion occurs passively through a concentration gradient, as it ensures that cells receive oxygen and release carbon dioxide.
- **Second Process:** No net movement of gases because concentrations of gases are balanced.
- **Third Process:** Diffusion of Gases occurs to ensure that gases move through a concentration gradient, maintaining equilibrium.
- **Fourth Process:** No net movement of gases. Sodium ions (Na^+) are transported into the cell against a concentration gradient, to maintain proper sodium balance and osmotic regulation.

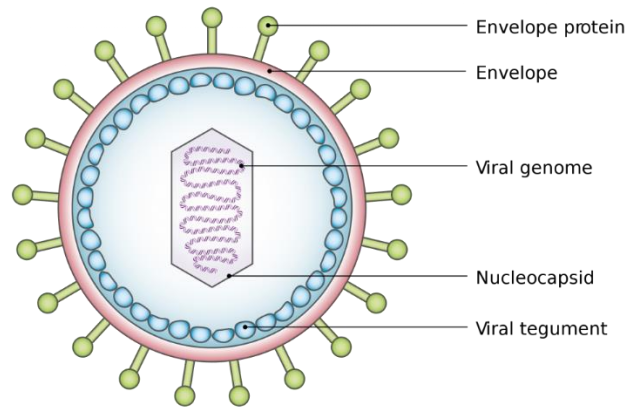
3.

(i)

- **Artery:** carries oxygenated blood from the heart to the body, and supplies nutrients and oxygen to the tissues.
- **Vein:** transports deoxygenated blood from body tissues to the heart. Also contains valves to prevent the backflow of blood.

- **Capillaries:** tiny blood vessels connecting arterioles and venules. They facilitate the exchange of gases, nutrients, and waste products between the blood and tissues.

(ii)



(iii)

HIV targets and damages CD4 cells to weaken the immune system, making the individual susceptible to infections. Untreated HIV infection progresses to AIDS, leading to life-threatening infections and illnesses.

4.

(i)

- Increase in concentration of the hormone X in the blood.
- Affects hormone production by the gland Y.
- Decrease in concentration of hormone X in the blood.
- Increase in concentration of hormone Z in the blood.

(ii)

- Feedback Regulation
- Specificity

Practical Portion

Marks: 30

1.

(i)

- Maintains temperature
- Uniform heating

(ii)

(a)

- Measure the mass of the food sample and treat it using a calorimeter.
- Measure the temperature change.
- Calculate the energy using the formula $Q = mc\Delta T$

Q = energy

c = specific heat capacity of water

m = mass of water

ΔT = temperature change.

(b)

- Determine the energy released using calorimetry
- Convert it to kilojoules (kJ).
- Obtain energy content per gram by dividing energy by the mass of the food sample.

(iii)

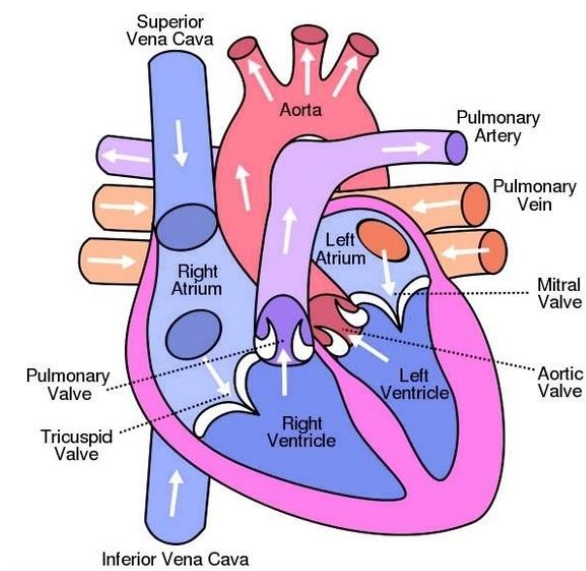
(a)

- During physical exercise, the rate and depth of breathing increase to meet the oxygen demand.
- The breathing and respiratory rate increases to facilitate increased exchange of oxygen and carbon dioxide.

(b)

- Vital capacity increases because exercise strengthens the respiratory muscles which allows more efficient expansion and contraction of the chest cavity.
- Results in improved lung function and endurance.

2.



3.

(i)

- Eukaryotic organisms, moist habitats, nutrient absorption from surroundings.
- Have cell walls made of chitin.
- May reproduce sexually or asexually.
- e.g. yeast, mushrooms.

(ii)

- Prokaryotic microorganisms with variable shapes
- Have cell walls made of peptidoglycan.
- Reproduce asexually through binary fission.
- May be beneficial or harmful.

(iii)

- Non-living infectious agents, cause diseases in animals, plants, and bacteria.
- Lack of cellular structures only having genetic material (DNA or RNA).
- The host is necessary for reproduction.