



Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. xylem → i. carries water and minerals up from the roots
2. phloem → h. carries food made in the leaves, up and down
3. transpiration → e. water leaving a plant as vapor through the stomata
4. guttation → g. water leaving a leaf as drops through hydathodes
5. urinary bladder → a. stores urine
6. spiracles → d. holes along an insect's body through which air enters
7. alveoli → b. tiny air sacs in the lungs where gases are exchanged
8. lenticels → f. small openings in the bark of woody stems

K • 4

Each carries 0.5 mark.

2 Multiple choice

i. b. transportation

U • 1

Transportation carries the wastes from the cells to the excretory organs (the blood takes carbon dioxide to the lungs and urea to the kidneys). Excretion then throws them out of the body.

ii. b. spiracle

K • 1

Insects breathe through spiracles, holes along their sides that open into air tubes. Stomata and lenticels belong to plants, and skin is how an earthworm breathes.

iii. c. Plants excrete extra water both as a gas (vapor) and as a liquid (drops).

U • 1

Water leaves as vapor by transpiration through the stomata, and as liquid drops by guttation through the hydathodes. Plants never give out ice.

iv. d. respiration

K • 1

Breaking down glucose with oxygen to release energy is respiration.

v. a. through a canal system

U • 1

Water carrying food and oxygen flows in through the ostia, along the sponge's canal system, and out through the osculum. Transport through the coelenteron is Hydra's way, and through the cell membrane, Amoeba's.

3 Label the diagram

- | | |
|-----------------|-----------------------|
| 1. bronchus | 5. nose |
| 2. lung | 6. trachea (windpipe) |
| 3. diaphragm | 7. bronchioles |
| 4. nasal cavity | 8. alveoli (air sacs) |

K • 4

Each carries 0.5 mark.

4 Very short answers

a. MARKING SCHEME

K • 1

✓ glucose + oxygen → carbon dioxide + water + energy.

b. MARKING SCHEME

K • 1

✓ Gills.

c. MARKING SCHEME

K • 1

✓ Any one of urea, uric acid, extra salt or water.



- d. MARKING SCHEME U · 1
✓ The osculum.

5 Short answers

- a. MARKING SCHEME U · 2
✓ Breathing is the exchange of gases (taking in and giving out air); respiration is breaking down food with oxygen to release energy.
✓ Breathing happens in the lungs; respiration in every living cell (or breathing is physical, respiration chemical).
- b. MARKING SCHEME U · 2
✓ Wastes such as carbon dioxide and ammonia diffuse out through the cell membrane into the water.
✓ Extra water collects in the contractile vacuole, which bursts it out of the cell.
- c. MARKING SCHEME U · 2
✓ Insects breathe through spiracles and tracheae; fish through gills.
✓ Insects take oxygen from the air; fish take oxygen dissolved in water.
- d. MARKING SCHEME A · 2
✓ Germinating seeds grow fast, so they respire fast.
✓ They give out enough carbon dioxide to turn lime water milky (dry seeds respire very slowly).
- e. MARKING SCHEME A · 2
✓ Roots need oxygen from the air between the soil particles to respire.
✓ Waterlogged soil has no air, so the roots can't respire and die.

6 Long answer

ANSWER

U · 4

The human body removes wastes through three main organs:

- **Skin:** sweat glands give out sweat: extra water, salt and a little urea.
- **Lungs:** carbon dioxide made by respiration is breathed out, with some water vapor.
- **Kidneys:** the urinary system removes most other wastes. The two **kidneys** filter the blood and take out urea, uric acid, extra salt and water, and harmful chemicals, as **urine**. The two **ureters** carry the urine to the **urinary bladder**, which stores it, and it is passed out of the body through the **urethra**.

MARKING SCHEME

- ✓ Skin: sweat glands give out sweat (extra water, salt, a little urea).
- ✓ Lungs: carbon dioxide made in respiration is breathed out.
- ✓ Kidneys filter the blood and remove urea, uric acid, extra salt and water as urine.
- ✓ The ureters carry urine to the urinary bladder, which stores it; it leaves through the urethra.



7 Think

ANSWER

HA - 2

When we run, our muscles do much more work and need much more **energy**. They get it by respiration, so they respire faster: they use oxygen faster and make more carbon dioxide. To supply the extra oxygen and remove the extra carbon dioxide, we **breathe faster and more deeply**. And the **heart beats faster** to pump the blood more quickly, carrying oxygen and glucose from the lungs and gut to the muscles, and carbon dioxide from the muscles to the lungs.

MARKING SCHEME

- ✓ Working muscles need more energy, so they respire faster, using more oxygen and making more carbon dioxide.
- ✓ We breathe faster to take in more oxygen and remove carbon dioxide, and the heart beats faster to carry them between the lungs and the muscles.

8 Activity: Colored water climbs a stem (Activity 5.1)

(not marked)

WHAT STUDENTS SHOULD FIND

The white petals slowly take on the color of the water, first at their edges and veins; by the next morning the color is clear. The colored water traveled up the stalk in the xylem, the tissue that carries water and minerals up from the roots. A cut across the stalk shows colored dots, the ends of the xylem tubes.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	13	14	4	2	33

