Year 10 | Biology

IGCSE-pathway diagnostic assessment • Cells, transport, enzymes and ecology

Student name: _____ Date: _____

Suggested time: 55 minutes. Show working and explain your reasoning. This is an independent diagnostic, not an official examination paper.

1. Compare plant and animal cells, naming two structures shared by both and two structures characteristic of plant cells. [5 marks]

2. Explain how the structure of a red blood cell helps it transport oxygen. [5 marks]

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3. A potato cylinder gains mass from 5.0 g to 5.8 g in distilled water. Calculate percentage mass change and explain the process responsible. [7 marks]

4. Explain why enzyme activity may increase with temperature up to an optimum and then decrease sharply. [7 marks]

5. Design a fair investigation into how light intensity affects photosynthesis in pondweed. Include independent, dependent and two control variables. [9 marks]

6. A food chain is grass → rabbit → fox. Explain why less energy is available at each successive trophic level. [6 marks]

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Keep this section separate from the student during the assessment. The marks are diagnostic prompts, not an official IGCSE mark scheme.

Suggested responses and assessment notes

1. (5 marks) Shared: membrane, cytoplasm, nucleus, mitochondria (any two); plant: cell wall, chloroplast, large permanent vacuole (any two).

2. (5 marks) Biconcave shape increases surface area; no nucleus in mature mammalian cells leaves space for haemoglobin.

3. (7 marks) (0.8/5.0)×100 = 16%; osmosis of water into cells across partially permeable membranes.

4. (7 marks) Increased collisions up to optimum; high temperatures alter active-site shape by denaturation.

5. (9 marks) Distance or light level as independent variable; bubbles/minute or oxygen volume/time as dependent; control temperature, plant size, carbon dioxide, time.

6. (6 marks) Energy lost in respiration, heat, movement and waste; not all biomass is eaten or assimilated.

What to observe

Look for subject knowledge, accuracy, use of appropriate terminology, clarity of reasoning, interpretation of command words, and ability to justify or evaluate when asked.

Suggested diagnostic approach

Record which questions were attempted independently, which required prompts, and whether difficulties arose from concepts, literacy, calculations or time management. Plan follow-up teaching around recurring misconceptions.

Curriculum note

This is a general Year 10 IGCSE-oriented diagnostic. It is not endorsed by Cambridge, Pearson Edexcel or the IB. Topic order and examination demands differ by board and school; adjust to the student’s actual specification.

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