5090 Biology Paper 2 - Respiration

Topical questions | 3 questions

1. Question | 5090 Oct-Nov 2023 P2 V1 Q7

7 **(a)** A root hair cell in a plant is respiring aerobically.

(i) Name the structures within the cell that carry out aerobic respiration.

..... [1]

(ii) Write the balanced symbol equation for the aerobic respiration of glucose, $C_6H_{12}O_6$.

..... ⟶ .....

[2]

(b) The plant experiences changing weather conditions including:

high temperature **heavy rain** **high winds** **low humidity**

State the weather condition that may lead to a root hair cell respiring anaerobically and explain your answer.

weather condition .....

explanation .....

.....

[2]

[Total: 5]

2. Question | 5090 Specimen 2023 P2 Q5

5 Compare each of the following processes:

(a) aerobic respiration and anaerobic respiration

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..... [3]

(b) anaerobic respiration in muscles and anaerobic respiration in yeast

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..... [3]

(c) photosynthesis and phototropism.

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..... [4]

[Total: 10]

3. Question part 1/2 | 5090 May-June 2026 P2 V1 Q8

8 A person needs energy to survive even if they are not moving.

(a) Give **two** uses of energy in a person who is **not** moving.

1 .....

2 .....

[2]

(b) The energy needed by a person who is not moving is called the basal metabolic rate.

Table 8.1 shows the basal metabolic rate for females of different ages.

Table 8.1

age /years	basal metabolic rate /kJ per kg of body mass per hour
10	5.5
30	4.2
50	3.8
70	3.6

(i) Identify the best description for how the basal metabolic rate changes as females get older.

Tick (✓) **one** box.

drops at a decreasing rate	
drops at a steady rate	
drops at an increasing rate	

[1]

3. Question part 2/2 | 5090 May-June 2026 P2 V1 Q8

(ii) The energy needed for the basal metabolic rate is released in respiration.

6.5 kJ of energy is released per gram of glucose.

Complete the balanced symbol equation for aerobic respiration.

$C_6H_{12}O_6$ + ... → ..... + ...

[2]

(iii) A 30-year-old female has a body mass of 50 kg.

Calculate how many grams of glucose they would have to eat in one hour to provide the energy for their basal metabolic rate.

Use the information in Table 8.1 **and** in **8(b)(ii)** to help you.

Give your answer to **three** significant figures.

Space for working.

answer = ... g [3]

[Total: 8]