**GENERAL HUMAN BIOLOGY – YEAR 11**

**TASK 1 – RESPIRATION PRACTICAL – MARKING KEY**

***RESULTS & DISCUSSION***

1. Fill in your results in the table below [4 marks]

* Most of the data filled in table (1 mark)
* Table all filled in (2 marks)
* Above plus bag 3 showing minimal respiration (thus less increase in volume) (3 marks)
* Above plus bag 4 showing minimal respiration (thus less increase in volume) (4 marks)

2.Graph your results on the separate graph paper [6 marks]

* Title (with both variables) – 2 marks
* Time on horizontal axis (with units) – 1 mark
* Volume on vertical axis (with units) – 1 mark
* Line graph drawn – 1 mark
* Appropriate scale used – 1 mark

3. In which flask(s) did respiration occur? What evidence do you have for your answer? [3 marks]

* Bag 1 or 2 (1)
* Bag 3 (small amount of respiration) (1)
* Increase in circumference (size) of balloons(1)

4. What was the purpose of including flask 1 in the experiment? What does it allow you to do?

[2 marks]

* Control (1)
* To compare the results of experiment (1)

5. What was the gas that accumulated in the flasks? [1 mark]

* Carbon dioxide

6. What was the difference in the set-up of flasks 2 and 3? What does this tell you about respiration, explain your answer? [3 marks]

* Bag 2 in the sun and Bag 3 in the fridge/cool (1)
* Shows that Bag 2 increased more than Bag 3 (1)
* Results show that yeast respire more actively in warmer temperatures (1)

7. What happened in flask 4 ? Explain why this happened with reference to the respiration equation [2 marks]

* No (not much) volume increase (1)
* Sweetener is not glucose, as glucose is needed for the cellular respiration equation (glucose + oxygen 🡪 carbon dioxide + water + energy) (1)

8. What is the difference between sugar and sweetener ? [2 marks]

* Sweetener is artificial form of glucose (1)
* Yeast is not able to use it for cellular respiration, unlike glucose (1)

9. Which flasks do you think would have released the most energy ? Explain why you think so ?

[2 marks]

* Bag 2 (1)
* This had water, sugar and was placed in a warm temperature (sun) ensuring the conditions were optimal for maximum cellular respiration (1)

10. Which flask(s) had a different odour? Explain why the odours changed in some bags and not others. [2 marks]

* Flask number (1)
* Explanation (1)

11. This experiment shows the production of carbon dioxide from anaerobic respiration. If the yeast had been respiring aerobically, how would the amount of gas produced in the bags change ? Explain your answer [2 marks]

* Bag volume would not change
* Volume of oxygen taken up by yeast would be equal to volume of carbon dioxide produced

12. Explain what may happen if human cells produced alcohol as a product of anaerobic respiration instead of lactic acid. [2 marks]

* Constantly drunk (high alcohol level in blood) (1 mark).
* Unable to function normally (1 mark)

13. Suggest why cardiac muscle of the heart has a lower lactic acid tolerance than skeletal muscles.

[2 marks]

* Cardiac muscle completely reliant on oxygen to function (1)
* Skeletal muscles can function anaerobically (1)

14. Using your results, determine the rate at which carbon dioxide was produced for each flask.

(Hint: Change in amount of gas produced/change in time) [3 marks]

* One mark for each flask’s calculations

15. Does the rate of carbon dioxide production indicate the rate of respiration occurring in the flask? Explain your answer. [2 marks]

* Yes (1)
* Carbon dioxide is the product of respiration (1)