

Respiration

Question Paper 7

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Energy and respiration
Sub Topic	Respiration
Booklet	Theory
Paper Type	Question Paper 7

Time Allowed : 60 minutes

Score : / 50

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

1 Carbohydrates and lipids are important fuels in generating ATP in animal cells.

(a) Explain the relative energy values of carbohydrate and lipid as respiratory substrates.

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..... [3]

Aerobic respiration uses oxygen and produces carbon dioxide as a waste substance. Animal cell metabolism can be analysed using the respiratory quotient, RQ. The RQ is the volume of the carbon dioxide produced divided by the volume of the oxygen consumed.

(b) State typical RQ values for carbohydrates and lipids.

carbohydrate

lipid [2]

The Siberian hamster, a small rodent like a mouse, had its RQ measured at different air temperatures. Fig. 1.1 shows the results of this experiment.

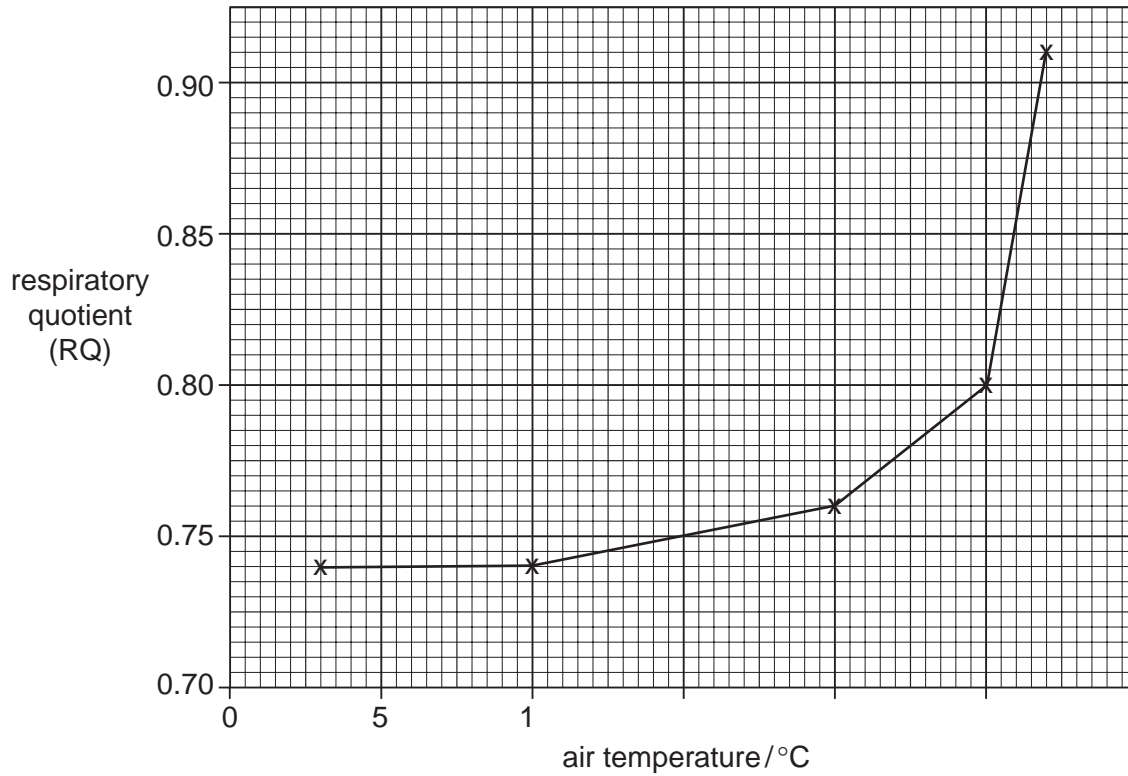


Fig. 1.1

- (c) Using the information in Fig. 1.1, describe and explain the relationship between RQ and air temperature.

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- (d) State a circumstance under which the RQ value would rise to over 1.0.

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4 Fig. 2.1 shows the reduction of NAD that occurs during respiration.

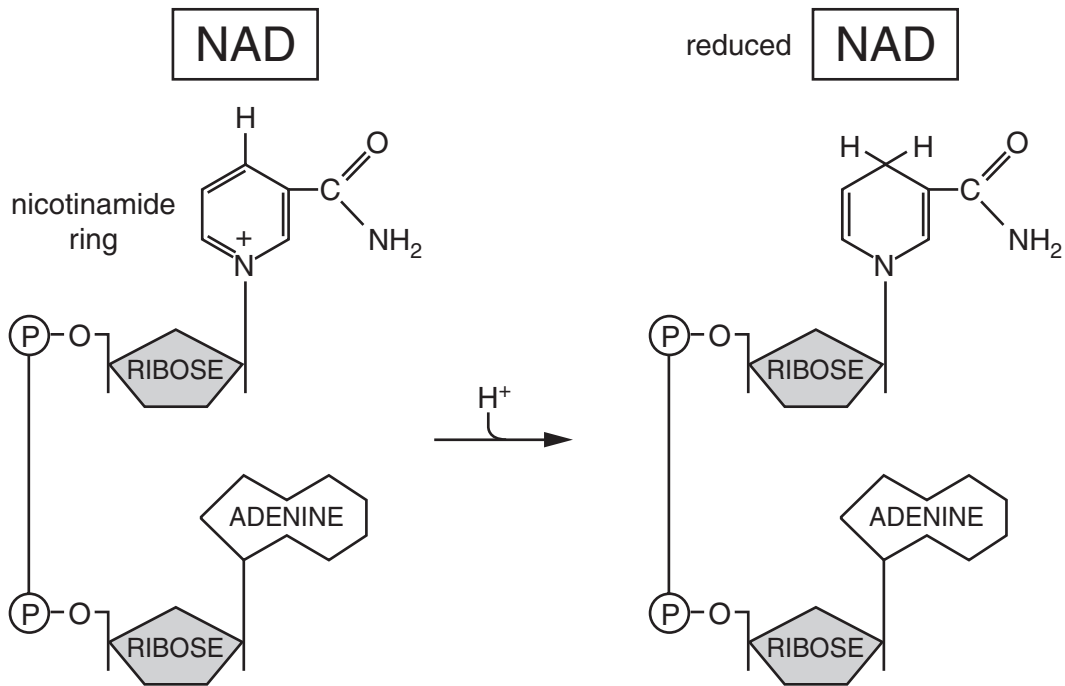


Fig. 2.1

(a) State two specific places in the eukaryotic cell where NAD is reduced.

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(b) Describe the role of NAD in cellular respiration.

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(c) Explain why NAD cannot be regenerated from reduced NAD in mitochondria in the absence of oxygen.

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- (d) Yeast can respire aerobically and anaerobically. When there is insufficient oxygen, yeast cells switch from aerobic to anaerobic respiration. This results in a significant increase in the rate of glucose uptake and glycolysis in the yeast cells.

Suggest why the rate of glycolysis increases significantly when yeasts cells switch from aerobic to anaerobic respiration.

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[Total : 10]