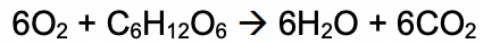


(Respiration (aerobic and anaerobic, energy release))

Q1.(2021)



Q2.(2021)

mitochondria / mitochondrion

Q3.(2021)

any **two** from:

- movement / muscle contraction
- keeping warm
- active transport
- building larger molecules

Q4.(2021)

any **two** from:

- anaerobic produces lactic acid **and** aerobic does not
- aerobic produces carbon dioxide **and** anaerobic does not
- aerobic produces water **and** anaerobic does not
- aerobic occurs (mainly) in the mitochondria **and** anaerobic does not
- anaerobic releases less energy than aerobic

Q5.(2021)

carbon dioxide

ethanol

Q6.a)(2021)

pondweed takes in CO_2 for photosynthesis

snail **and** pondweed are respiring producing CO_2

Q6.b)(2021)

(no light so) no photosynthesis
or
plant is not taking in CO₂

and

snail **and** plant are respiring and
so are releasing CO₂

Q6.c)(2021)

snail is being decayed /
decomposed / broken down

(by) decomposers / bacteria (in
pond water / snail)

(therefore) respiration (of
decomposers / bacteria)
releases CO₂

Q7.a)(2023)

any **two** from:

- (effect) muscle fatigue **or**
oxygen debt occurs (1)

(reason) caused by (build-up
of) lactic acid (1)

- (effect) (continued) heavy /
deep / fast breathing (1)

(reason) to provide the
oxygen needed to break down
(built-up) lactic acid (1)

- (effect) (continued) increased
heart rate (1)

(reason) to provide the
oxygen needed to break down
(built-up) lactic acid (1)

- (effect) fewer / weaker muscle
contractions (1)

(reason) (because) less
energy is released / available
(1)

Q7.b)(2023)

- test a group of athletes
- use at least two different types / intensities of exercise
- get each athlete to do all exercises **or** have a large (≥ 30) group doing each exercise
- record heart rate for each athlete before and after exercise **or** calculate increase in heart rate for each athlete after exercise
- calculate the mean increase in heart rates for each type / intensity of exercise
- compare mean increase in heart rates for each type / intensity of exercise
- control variables:
 - same (biological) sex **or** mix of sexes
 - same level of activity / exercise
 - same age
 - same caffeine / drug / medicine intake
 - same length of time for exercise
 - no health issues / illnesses
 - return to resting heart rate before each exercise

Q7.c)(2023)

(athlete is) faster / stronger

(because more muscle mass so)
more / stronger muscle
contractions

Q7.d)(2023)

hybridoma

Q7.e)(2023)

any **three** from:

- (cell) is cloned
- many (identical) cells are produced
- all the cells make the same antibody
- the antibody is (collected and) purified

Q7.f)(2023)

a monoclonal antibody only binds
to the anabolic steroid

Q7.g)(2023)

to show that the test is working

Q7.h)(2023)

evidence

no blue / visible dye (in control area)

reason

(because) no (free) monoclonal antibodies bound to control area

or

(because) there were no (free) monoclonal antibodies on the end of the (test) strip

Q7.i)(2023)

D