M1. (a) glucose is absorbed by diffusion into the bloodstream

1

then blood delivers glucose to muscles in capillaries

1

(b) to stop air getting in

1

(c) yellow

1

(d) collect the CO_2 / gas with a measuring cylinder / gas syringe

1

(volume collected) in a certain time using a timer / watch

1

(e) yeast produces ethanol but muscles produce lactic acid

marks can be awarded from correct word or balanced symbol equations

1

yeast produces CO_2 but muscles do not

answers must be comparative

1

both release small amounts of energy

1

ignore both occur without oxygen

[9]

M2. (a) (i) mitochondrion / mitochondria

must be phonetically correct

1

(ii) carbon dioxide / CO_2

1

water / H_2O

1

in either order
*accept CO2 but **not** CO^2*
*accept H2O **or** HOH but not H^2O*

(iii) diffusion

1

high to low concentration

allow down a concentration gradient

1

through (cell) membrane **or** through cytoplasm

*do **not** accept cell wall*

1

(b) ribosomes make proteins / enzymes

1

using amino acids

1

part A / mitochondria provide the energy for the process

allow ATP
*do **not** accept produce or make energy*

1

[9]

M3.(a) motor

allow efferent / postsynaptic
*allow **another** relay (neurone)*

1

(b) release of chemical (from relay neurone)

allow ecf for 'motor' neurone from (a)
allow release of neurotransmitter / named example

1

chemical crosses gap / junction / synapse

allow diffuses across
allow chemical moves to X

1

chemical attaches to X / motor / next neurone (causing impulse)

1

(c) (curare) decrease / no contraction

accept (muscle) relaxes

1

(strychnine) increase / more contraction

*if no other mark awarded allow 1 mark for (curare) decrease / no response **and** (strychnine) increase / more response*

1

[6]

M4.(a) more concentrated

must be a comparison

1

than the cell / cytoplasm

accept more salty / solutes / ions

*accept cell is less concentrated than solution for **2** marks*

1

(b) (i) turgid

1

(ii) plasmolysed

accept flaccid

1

(c) any **four** from:

- water left the cells (in A)
- by osmosis
- from dilute to more concentrated solution

  accept high to low water potential or from high to low water concentration
- via partially permeable membrane
- so cell membrane shrank away from cell wall

4

(d) water enters the cells (by osmosis)

*allow **1** mark for:*

1

they burst / lyse / lysis occurs

water leaves and cell shrinks (if they think it is hypertonic solution)

1

animal cells have no cell wall **or** plant cells have a cell wall

1

cell wall prevents lysis / bursting / allows turgidity

allow correct description

1

[12]

M5.(a) (i) diaphragm

accept phonetic spelling

1

(ii) (because) the volume (inside the jar) increases

*maximum **two** marks if no reference to correct part of model*

1

(causing) the pressure to decrease

1

(and) air enters the balloon

allow oxygen

1

(b) (i) (so it moves by) diffusion

*do **not** allow osmosis or active transport*

1

from a high concentration (of oxygen) to a low concentration

*allow down its / oxygen concentration gradient from the air **or** to the blood*

or

(because) there is a high(er) concentration (of oxygen) in the air **or** there is a low(er) concentration of oxygen in the blood

ignore reference to amount of oxygen

1

(ii) many gill <u>filaments</u>

must be in the correct pairs to gain 2 marks

1

(give a) large surface / area

*do **not** allow surface area to volume ratio*

or

thin

(so) short diffusion pathway

or

good blood supply

(to) maintain the concentration gradient

or

water continually flows over them / continually ventilated

(to) maintain the concentration gradient

1

[8]

M6. (a) (0.15 / 1.35) × 100

1

11.1 (%)

*allow 11.1 (%) with no working shown for **2** marks*

1

(b) to allow results to be compared
or
they had different masses at the start

1

(c) axis correct scale and labelled

1

5 points correctly plotted

*allow ecf from **05.1***
*allow **1** mark for 4 points correctly plotted*

2

line of best fit

1

(d) 0.5

allow 0.45–0.55

1

(e) (0.0 to 0.4) water moves into cells

1

(0.6 to 0.8) water leaves cells

1

by osmosis

1

(f) any **two** from:

- concentration of solutions
- drying of chips
- accuracy of balance
- evaporation from tubes

2

[13]