

- 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 CO₂ / 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 CO₂ 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 / CO₂ 1
- water / H₂O 1
- in either order*
*accept CO₂ but **not** CO²*
accept H₂O or HOH but not H²O
- (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 filaments
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)	$(0.15 / 1.35) \times 100$	1
		11.1 (%)	
		<i>allow 11.1 (%) with no working shown for 2 marks</i>	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	
		<i>allow ecf from 05.1</i>	
		<i>allow 1 mark for 4 points correctly plotted</i>	2
		line of best fit	1
	(d)	0.5	
		<i>allow 0.45–0.55</i>	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]