

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

- (a) (i) unrestricted / free / quick / easy water flow / continuous column / maintains transpiration stream; 1
- (ii) resists tension in water (column) / provides support / strength / maintains column of water / adhesion / prevents water loss
(allow waterproofing in correct context i.e. not absorbing); 1
- (b) (i) as total area of stomata decreases the rate of water flow decreases / decrease is proportional;
(reject proportional, 'as one goes up the other goes up' and 'same shape') 1
- (ii) increasing / higher temperature causes increasing / higher rate of evaporation / transpiration;
(not water loss) 1
- (iii) lower plateau (start and finish at same point);
(allow if curve sketched on original graph, reject 'curve is lower') 1
- (c) conserves water / reduces water loss / reduces transpiration / reduces evaporation;
high humidity (in pit) / reduced water potential gradient / less water blown away / increased diffusion pathway; 2

[7]

Q2.

- | | | |
|-----|--|------------|
| (a) | <u>left</u> ventricle; | 1 |
| (b) | (i) (left) ventricle / heart relaxes / diastole / filling / not contracting; | 1 |
| | (ii) elastic tissue / wall;
recoils / springs back (to maintain pressure);
("contraction / muscle causing recoil" negates second point) | 2 |
| (c) | correct answer, 666 to 667 <i>gains 2 marks; allow 1 mark for principle;</i>
correct time for 1 heartbeat as 90 (ms) or $630 \div 7$ /
60 $\div$ incorrect time identified from graph; | 2 |
| (d) | correct answer, 0.03, <i>gains 2 marks;</i>
(allow 1 mark for correct working, $16.6 \div 550$, if answer wrong) | 2 |
| | | [8] |

Q3.

- (a) contraction of (diaphragm) muscles flattens diaphragm;
contraction of intercostal muscles raises ribcage;
increase in volume decreases pressure;
- (b) (i) tidal volume increases steeply, then increase slows down after
10 to 15 km h⁻¹;
- (ii) breathing rate increases slowly then steeply after 10 to 15 km h⁻¹;
*(max 1 if no reference to speed where change occurs in
either (i) or (ii))*
- (c) $20 \times 2.75 = 55 \text{ dm}^3$;
(award 1 mark for correct method i.e. tidal volume $\times$ rate);

3

1

1

2

[7]