CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0654 CO-ORDINATED SCIENCES

0654/63 Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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International Examinations

1 **(a)** to give time for the plant to settle / adjust to the conditions ; [1]

(b) 2 ;
10 ; [2]

(c) still air distances – 4, 2 ;
moving air distances – 6, 8 (or ecf) ;
averages – 3, 7 (or ecf) ; [3]

(d) air movements increase the rate of transpiration ; [1]

(e) temperature / light (intensity) / humidity / the plant / pressure / time ; [1]

(f) check for anomalous results ;
(allow to improve reliability) [1]

(g) water used in photosynthesis / produced in respiration / used in growth / changing turgidity of cells ; [1]

[Total: 10]

2 **(a)** does not (easily) corrode / react ;
(good) conductor of heat ;
strong ;
can be moulded or worked into shape i.e. malleable ;
non toxic ; [max 2]

(b) will conduct electricity / puts the foil in an electrical circuit / when reacts with acid produces gas which <u>pops with lighted splint</u> ; [1]

(c) **(i)** (diagram shows test-tube) and delivery tube and inverted measuring cylinder ;
correct relationship with the water level in trough ;
(if not airtight 1 mark max) [2]

(ii) 90 ;
44 ; [2]

(d) 0.27 mm ;
0.13 mm ;
correctly shown on graph ; [3]

[Total: 10]

3 **(a)** aluminium, **or** a named plastic such as polyethene, polyvinyl chloride, nylon, polystyrene ; [1]

(b) 1.7, 2.3 ; [1]

(c) **(i)** correct labelling of axes / sensible scales ;
points correctly plotted (half square tolerance) ;
curve drawn ; [3]

(ii) the falling mass will take time to travel (1 metre even if the trolley weighs nothing) / impossible to travel a distance in 0 secs ; [1]

(d) curve drawn correctly below / to the right of the first curve ; [1]

(e) **(i)** (acceleration of) gravity / tension (in the string) ; [1]

(ii) **EITHER** gravity:
acts on the weight, **w** ;
which pulls the trolley ;

OR tension:
gravity acts on the weight ;
(causing tension in the string) which pulls the trolley ;
(answers to **(i)** and **(ii) must** match) [max 2]

[Total: 10]

4 **(a)** 10 mm ; [1]

(b) **(i)** answers as in table ;
answers given in millimetres ;

pH of enzyme	d_1(diameter of clear area) / mm
6.5	10
7.0	12
7.5	13
8.0	14
8.5	16
9.0	13

[2]

(ii) vertical axis and sensible scale ;
points plotted (within half square tolerance) ;
curve ; [3]

(iii) correct estimation of optimum from graph ; [1]

(iv) repeat experiment with a narrower range of pH for enzyme ;
between pH 8 and 9 ;
everything else / named condition the same ; [max 2]

(c) small intestine ; [1]

[Total: 10]

5 **(a)** **1a** (litmus) turns red ;
1b (litmus) turns blue ; [2]

(b) **2a** white precipitate ;
2b no precipitate ; [2]

(c) silver nitrate ; [1]

(d) **4a** blue precipitate ;
4b blue solution / blue precipitate dissolves giving blue solution ; [2]

(e) take equal volumes of the hydrochloric and nitric acids ;
and add litmus ;
add sodium hydroxide or ammonia solution and measure the volume needed (to turn the litmus blue) ; [3]

[Total: 10]

6 **(a)** **(i)** 12 ; [1]

(ii) 100/12 = 8.33 cm ;
= 0.0833 metres ; [2]

(iii) 12 ticks ; [1]

(iv) 6 s ; [1]

(v) 1/6 = 0.16**7** m / sec ; [1]

(vi) frequency = 12 / 6 = 2 Hz ; [1]

(b) waves drawn parallel to tank sides ;
correct length of reflected parts of waves (must be to left of barrier) ; [2]

(c) transverse ; [1]

[Total: 10]