Reproduction

Mark Scheme 1

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Reproduction
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Mark Scheme 1

Time Allowed: **52 minutes**

Score: **/43**

Percentage: **/100**

1 **(a)**	**Drawing:** **O** Clear lines and no shading; **S** Larger than photograph; **D** Hairs drawn precisely; **P** Seed area drawn with regard to shape; **Labels**: attachment / position of seed / hairs;	**[5]**	**4** drawing marks Hairs to be attached to the top end of fruit – not matted Hairs shown as straight, single lines **Ignore** ornamentation on seed. **Ignore** incorrect labels **Accept** alternative wording for hairs **Ignore** words which describe other biological features
(b) (i)	Length of fruit in Fig. 2.1 in mm / cm 73 +/– 2 mm / 7.3 +/– 0.2 cm; Length of fruit in drawing in mm / cm (+/– 2 mm or +/– 0.2 cm);	**[2]**	penalise once for incorrect / absent units
(ii)	Correct magnification and X;;	**[2]**	**Accept** error carried forward from **(b)(i)** **Accept** correct answer for 2 marks even if no working shown **Accept** X before or after magnification / “times” If answer incorrect allow max 1 for correct working e.g. length of drawing / length of image – in words or figures

<table>
<tr>
<td>(c) (i)</td>
<td>
<table>
<tr><th>feature</th><th>Dry fruit [Fig. 2.2]</th><th>Damp fruit [Fig. 2.3]</th></tr>
<tr><td>Hairs / parachute / pappus / AW;</td><td>Wide spread / AW
AND</td><td>Closed / close / AW;</td></tr>
</table>
</td>
<td>[2]</td>
<td>One mark for identifying feature wherever in table
Error carried forward for feature from label in 2a

2nd mark for description</td>
</tr>
<tr>
<td>(ii)</td>
<td>Five marks from:

dispersal:
1. dry / windy – seeds blown away;
2. increase of surface area / bigger to ‘catch’ the wind / breeze / air currents in the dry;
3. wet – drop to the ground / are not dispersed;
4. to spread away from parent plant / to new place / habitat;
5. avoids competition with parent plant / each other / avoids overcrowding / more space;

germination:
6. wet / damp soil / place / humid;
7. enzyme activation / working / respiration ORA;
8. warmer;
9. AVP;</td>
<td>Max [5]</td>
<td>Ignore pollen / spores dispersed by wind

4. must be linked to dispersal not just germinating in new habitat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Total: 16]</td>
<td></td>
</tr>
</table>

2 (a) (i)	**D**	(shoot / seedling) curves / bends / grows to one side**;** light from one / left side**;** unequal growth / more extension or growth of dark side / phototropism**;**	**[3]**	**Ignore** shorter because F is shorter **Ignore** reference to roots, D and E are the same grows / bends / curves to the side where light is coming from = 2 **Accept** reference to auxin / hormone
(ii)	**E**	tall(er) (shoot / seedling)**;** uniform light / light above stem / no light at all**;** competition for light / AW**;**	**[3]**	**Ignore** reference to roots, D and E are the same **Accept** big / long / grew a lot **Ignore** direct / plenty / large amounts of light / under the sky **Accept** etiolation / auxin not destroyed or equally distributed or produced

<table>
<tr><th>Question</th><th>Answers</th><th>Mark allocation</th><th>Guidance</th></tr>
<tr><td>(iii)</td><td>F (shoot / seedling) small(er) / AW;

Slow(er) / reduced growth / less well developed;

(grown in) colder or lower temperatures / diseased / lacks minerals / AVP;</td><td>[3]</td><td>Accept short(er) roots

Accept no growth / undeveloped
Ignore lack of water
Accept extreme temperatures
Ignore hot temperatures
Ignore photosynthesis
Accept nutrients / fertilisers</td></tr>
<tr><td>(b) (i)</td><td>two from
seeds / remains of stigma or style or pointed (tip) / stalk / seed attachment or seeds arranged at either side / seeds inside the fruit;;</td><td>[max 2]</td><td>Read through entire answer and award any correct points.
e.g. ‘Seeds at either side’ =
Accept number / shape / type of seed for ‘seeds’
Accept (fruit) is smooth</td></tr>
<tr><td>(ii)</td><td>Two rows from
<table><tr><th>Fruit G</th><th>Fruit H</th></tr><tr><td>Short(er) / rounded</td><td>Long(er) / narrow;</td></tr><tr><td>Less seeds / 6 seeds</td><td>more seeds / 13 seeds;</td></tr><tr><td>Seeds apart</td><td>seeds close together;</td></tr></table></td><td>[2]</td><td>Accept comparative answers on one side of the table

Accept more fruit mass (grey area) versus less fruit mass
Ignore seeds in a ring / AW</td></tr>
<tr><td>(c)</td><td>bursts open / explosive / eaten / water / dries out / animals / wind / AW;</td><td>[1]

[Total: 14]</td><td>Ignore seeds dispersed when fruit dies / rots</td></tr>
</table>

3 (a) (i)	dish **A** – 19/20, dish **B** – 2/20, and dish **C** 9/10;;	[2]	**A.** numbers 19, 2 and 9 only. Mark wherever these figures occur e.g. on dish. 1 mistake – 1 mark / 2 mistakes – no marks.
(ii)	800%;; *possible working* 18 – 2 = 16 $\frac{16}{2} \times 100 = 800\%$	[2]	Correct answer = 2 marks. Credit alternative methods of working if answer is incorrect. Might round down dish **B** to 1 / 10. = 1 mark. Might round up dish **C** to 18 / 20. = 1 mark. 80% = 1 mark. If error in table – award one working mark if applicable.
(iii)	(dish **C** no tomato juice and dish **B** has therefore) there is another chemical in juice which stops the germination AW; same pH as dish **B** but higher % in **C** so not pH sensitive; correct reference to osmotic / turgor / concentration of tomato juice / contains less water / absorbs less water; stops seeds developing near parent plant / prevents competition / saves overcrowding / lack space; AVP e.g. alleopathy / bacteria in juice;	[max 2]	Dish **C** is referred to from the question by implication. **I.** dish **C** has more nutrients Chemicals – accept suitable named examples e.g. Vit. C.
(iv)	dish **A** – control; for comparison purposes / see difference; to show it was not pH 6 – weak acid solution;	[max 1]	Ignore fair test / efficiency. **A.** to test viability of seeds.

(b)	1. same batch of seeds / same type / same maturity; 2. same volume of solution; 3. same environmental conditions of oxygen; 4. same environmental conditions of light / warmth; 5. same number of seeds for each test; 6. wash surface of seeds first to remove juice of fruit chemicals / bacteria / spores / AW; 7. suitable range of pH solutions / suggest 3 or more named pH / acid solutions; 8. how obtained such as use of buffers or named liquids e.g. vinegar 9. same period of time for soaking or germinating; 10. repeat whole procedure / two + dishes or use replicas at the same time; 11. pl graph;	[max 6]	**I.** mass. **I.** Same environment alone – too vague. **A.** Same temperature. Need more than one seed for pt 5. few / several – too vague. from low pH to high pH – 3 or more examples. (pt 7) e.g. strong and weak acid and weak alkali = 3 solution **I.** 'few' or 'several' days. (specified number of days not months) Not just for number of seeds – that is pt. 5.
		[Total: 13]	