

# Reproduction

## Mark Scheme 2

<b>Level</b>	IGCSE
<b>Subject</b>	Biology
<b>Exam Board</b>	CIE
<b>Topic</b>	Reproduction
<b>Sub-Topic</b>	
<b>Paper Type</b>	Alternative to Practical
<b>Booklet</b>	Mark Scheme 2

**Time Allowed:** 51 minutes

**Score:** /42

**Percentage:** /100

<p>1 (a)</p>	<p>Drawing: 1 flower as in fig. 2.1; 2 no shading / artistic lines; ..... Label: 1 three stamens / anthers + filaments / anthers; 2 stigma / style; 3 petals; 4 sepal; 5 ovary;</p> <p>[MAX 6]</p>	<p><b>A</b> + or – petals / floral parts separate (even if receptacle is not drawn.) <b>R</b> stylised flowers</p> <p><b>A</b> all labels on stylised diagrams label line to touch surface / inside / curved part</p> <p>one on left must have double lines either side and can be labelled to base of receptacle</p> <p>label marks = MAX 4 but MAX 2 for stylised diagrams</p>		
<p>(b)</p>	<p>stamen / anther / filament is outside / hanging / loosely attached; long / bendy filament; style / stigma is feathery / furry / large SA / long / large AW;</p> <p>[3]</p>	<p><b>I</b> labels (but can accept e.c.f. from diagram) <b>A</b> pollen sacs</p> <p><b>I</b> sticky / outside / exposed <b>I</b> pollen (not visible) / pistil / carpel alone <b>I</b> negative comments e.g. no nectaries / petals / smell</p>		
<p>(c) (i)</p>	<p><b>one</b> similarity: both have stamens / anthers / stigmas;</p> <p>[1]</p>			
<p>(ii)</p>	<table border="0"> <tr> <td data-bbox="235 917 825 1182"> <p>Fig. 2.1 petals stamens / anthers enclosed within petals /  firmly attached stigma / style enclosed within petals  stigma /style is small / curved / single</p> </td> <td data-bbox="825 917 1236 1252"> <p>Fig.2.2 Not present; stamens / anthers exposed / outside / loosely attached; stigma / style outside the flower; stigma / style has large SA / large / feathery / hairy / multiple;</p> <p>[4]</p> </td> </tr> </table>	<p>Fig. 2.1 petals stamens / anthers enclosed within petals /  firmly attached stigma / style enclosed within petals  stigma /style is small / curved / single</p>	<p>Fig.2.2 Not present; stamens / anthers exposed / outside / loosely attached; stigma / style outside the flower; stigma / style has large SA / large / feathery / hairy / multiple;</p> <p>[4]</p>	<p>need to be matched pairs <b>I</b> size / colour / scent <b>A</b> filament</p> <p>can be comparative <b>I</b> sticky <b>I</b> carpel <b>A</b> male + female parts are inside / outside flower = 1 need both, do not award if stigma/stamen given</p>
<p>Fig. 2.1 petals stamens / anthers enclosed within petals /  firmly attached stigma / style enclosed within petals  stigma /style is small / curved / single</p>	<p>Fig.2.2 Not present; stamens / anthers exposed / outside / loosely attached; stigma / style outside the flower; stigma / style has large SA / large / feathery / hairy / multiple;</p> <p>[4]</p>			
<p>[Total: 14]</p>				

- 2 (a) A – stigma;  
B – style;  
C – ovule/embryo sac; R. ovary/ovum/egg/carpel [3]
- (ii) correct path either side of the ovule, entering via the micropyle – either double or single line; [1]
- (b) (i) pollen grain 4 – 5 mm diameter, and distance accept 50 – 90 – 120 mm;
- (ii) working:  
path length  $\div$  pollen diameter  
 $x \div 4$  or  $x \div 5$   
correct answer [to nearest whole number] ;; allow ecf  
*[this may need to be calculated several times for different figures]* [2]

[Total: 7]

- 3 (a) 1. respiration / fermentation of yeast cells; *I reference to aerobic / anaerobic.*
2. producing / releasing carbon dioxide;
3. carbon dioxide causes solution / indicator becoming acidic / yellow;  
*[needs mention somewhere of carbon dioxide but do not award for concept that carbon dioxide is acidic alone]* [3]
- (b) 1. use a set volume of yeast culture; *[accept 20 cm<sup>3</sup>]*
2. temperature controlled water bath / at room temperature;
3. means of collecting gas – gas syringe / inverted gas cylinder or syringe or gas jar or measuring cylinder full of water / test tube;  
*[ignore counting bubbles / height of foam]*
4. reference to timing;
5. repeat measurements;
6. calculate average;
7. airtight apparatus to stop leakage / putting in a bung;
8. shake culture (so cells do not settle);
9. AVP (e.g. reference to adding sugar); [max 6]
- (c) (i) O clear outline representation of yeast cell and more than 8 cm;  
must have a bud, *I minor shading,*
- D double line for cell wall; *[bud should not be cut off with cross wall]*
- L label one from: nucleus / vacuole / nucleolus / cell membrane / mitochondrion / cytoplasm / ribosome / cell wall / daughter cell or bud / mother cell;  
*ring the accepted label and use letters O, D and L for ticks.* [3]
- (ii) size of cell measured on Fig. 2.2 between X and Y between 8.0 and 8.2cm or 80 and 82mm (units essential);
- $\frac{\text{drawing}}{\text{Fig. 2.2}} = \text{magnification (allow even if forget } \times 5000)$
- allow ecf.*
- answer (needs to involve  $\times 5000$  and no units given); [3]

[Total: 15]

- 4 (a) correct lines to structure shown in Fig. 3.1  
a chromosome or (i);  
cytoplasm or (ii);  
nucleus or (iii); [3]
- (b) (i) anthers / pollen sacs / ovary / ovules; [1]  
(ii) ovary / follicle / testis(es) / oviduct / fallopian tube;  
*I reproductive organs.* [1]
- (c) maintain chromosome **diploid** number on fertilisation;  
reference to **haploid** gametes reference to 23 chromosomes;  
variation;  
when gametes fuse the correct chromosome number is attained;  
*[answers are sometimes difficult to follow – read through whole answer and dredge]* [max 1]

[Total: 6]