PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

# BIOLOGY



## MARK SCHEME

TOPIC 8: ORIGINS OF GENETIC VARIATION

## ORIGINS OF GENETIC VARIATION

| SCORE | PERCENTAGE |
| --- | --- |
| /16 | % |

STEMUP

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# Mark Scheme

Q1.

| Question Number | Answer | Additional Guidance | Mark |
|---|---|---|---|
| (i) | A description that makes reference to the following:<br>• {independent / random} assortment of chromosomes (1)<br>• {crossing over / recombination / chiasmata formation} between homologous chromosomes (1) | **Accept** correct descriptions of crossing over between homologous chromosomes | **(2)** |

| Question Number | Answer | Additional Guidance | Mark |
|---|---|---|---|
| (ii) | An answer that makes reference to the following:<br>• CC, $Cc^{ch}$, $Cc^{h}$, Cc (1) | **Accept** alleles in different order e.g. $c^{h}C$ | **(1)** |

| Question Number | Answer | Additional Guidance | Mark |
|---|---|---|---|
| (iii) | An answer that makes reference to the following:<br>• parents identified as $Cc^{h}$, $Cc^{ch}$ (1)<br>• $F_1$ that are crossed identified as $c^{ch}c^{h}$ × $c^{ch}c^{h}$ (1)<br>• $F_2$ identified as $c^{ch}c^{ch}$, $c^{ch}c^{h}$, ($c^{ch}c^{h}$), $c^{h}c^{h}$ (1) | **Accept** all mps from Punnett squares<br>**Accept** any clear indication that $c^{ch}c^{h}$ × $c^{ch}c^{h}$ are crossed | **(3)** |

Q2.

| Question Number | Answer | Additional Guidance | Mark |
|---|---|---|---|
| | An answer that makes reference to the following:<br>• parent genotypes are AaBb and aabb (1)<br>• gametes are AB, Ab, aB, ab and ab (1)<br>• $F_1$ genotypes are AaBb, Aabb, aaBb and aabb (1)<br>• probability 0.25 / ¼ / 25% (1) | **ACCEPT** correct answers from Punnett square | **4** |

Q3.

| Question Number | Answer | Mark |
|---|---|---|
| | The only correct answer is D aaBb x aaBb<br><br>*A is incorrect because the parents would be round and yellow*<br>*B is incorrect because no yellow seeds could be produced*<br>*C is incorrect because no yellow seeds could be produced* | **1** |

Q4.

| Question Number | Answer | Additional Guidance | Mark |
|---|---|---|---|
| (i) | B ovum and secondary oocyte<br><br>A is incorrect because secondary oocyte is diploid<br>C is incorrect because the secondary oocyte is diploidD is incorrect because the primary oocyte is diploid | | 1 |
| (ii) | *An explanation that makes reference to:*<br><br>• crossing over (1)<br><br>• which swaps {alleles / DNA / genes} between {homologous chromosomes} (1)<br><br>• independent / random assortment (1)<br><br>• because it is random movement of homologous chromosomes to poles (1) | **Allow** random movement of paternaland maternal chromosomes / random combinations of paternal and maternal chromosomes | 4 |