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**Cambridge Ordinary Level**

# MARK SCHEME for the May/June 2015 series

## 5090 BIOLOGY

**5090/31** Paper 3 (Practical Test), maximum raw mark 40

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Mark schemes will use these abbreviations:

| | |
|---|---|
| **;** | separates marking points |
| **/** | alternatives |
| **()** | contents of brackets are not required but should be implied |
| **R** | reject |
| **A** | accept (for answers correctly cued by the question, or guidance for examiners) |
| **Ig** | ignore (for incorrect but irrelevant responses) |
| **AW** | alternative wording (where responses vary more than usual) |
| **AVP** | alternative valid point (where a greater than usual variety of responses is expected) |
| **ORA** | or reverse argument |
| **underline** | actual word underlined must be used by candidate (grammatical variants excepted) |
| **max** | indicates the maximum number of marks that can be given |
| **+** | statements on both sides of the + are needed for that mark |

| Question | Expected answers | Additional guidance | Marks |
|---|---|---|---|
| 1 (a) | credit neat drawing, appropriate shape ;<br><br>testa double line ;<br><br>cotyledon and testa correctly labelled ; | **Ig** plumule and radicle<br><br>clear lines, at least 50 mm height | [3] |
| (b) (i) | description of results for testa, e.g. no fizzing, bubbling or frothing ;<br><br>description of result for cotyledons, e.g. reference to froth ; | **A** some fizzing for testa<br>**A** no change / nothing happens<br>**Ig** ref. oxygen on its own, must reference bubbles, etc. | [2] |
| (ii) | reference to little or no catalase in testa ;<br><br>catalase present in cotyledons ; | **A** ecf from previous questions<br>correct comparative statement scores both marks | [2] |
| (iii) | testa is inactive **+** cotyledons active / metabolising / respiring / carrying out reactions / AW ; | **Ig** ref. to living vs. non-living | [1] |

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| Question | Expected answers | Additional guidance | Marks |
|---|---|---|---|
| (iv) | same mass / weight / surface area (of tissue) ;<br><br>measure the volume of oxygen produced ;<br><br>grind / crush tissue ;<br><br>control temperature ;<br><br>measure depth of froth / count no. bubbles released ; | **Ig** amount / size<br>**A** surface area | [1] |
| (c) (i) | reference to separating tissues ;<br><br>iodine solution added ; | | [2] |
| (ii) | starch present in cotyledons **+** no starch in testa / more starch in cotyledons ; | statement must be comparative or conclusions given for both tissues | [1] |
| (d) (i) | suitable scale (at least half of the grid used) **+** correct orientation of axes ;<br><br>both axes fully labelled ;<br><br>points plotted correctly ;<br><br>neat ruled line correctly joining points ; | at least one zero required at origin<br><br><br><br>**A** ± ½ square<br><br>**R** extrapolation beyond 10 | [4] |
| (ii) | 2.5 (arbitrary units) ; | accept figure consistent with graph | [1] |
| (iii) | amylase breaks down (stored) starch ;<br><br>to maltose / glucose ; | <br><br>**A** mono / disaccharides / reducing sugars | [2] |
| | | | **[Total 19]** |
| 2 (a) (i) | cells drawn to correct scale with correct proportions ;<br><br>quality of drawing ;<br><br>cell wall shown with double line ;<br><br>nucleus shown in correct position in both cells ;<br><br>chloroplasts present ; | approx. 75 – 95 mm<br><br>clean and clear lines, no internal shading<br><br><br><br>min. 10 chloroplasts | [5] |

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| Question | Expected answers | Additional guidance | Marks |
|---|---|---|---|
| (ii) | cell wall ;<br><br>chloroplasts ; | | [2] |
| (b) (i) | xylem (vessel) ; | | [1] |
| (ii) | transport of water ;<br><br>transport of mineral salts / named example ;<br><br>reference to (mechanical) support ; | | [max 2] |
| (c) | reference to putting cut stem in water containing a dye / named example ;<br><br>leave for suitable or stated time ;<br><br>cut sections of stem ;<br><br>observe with hand lens or microscope ;<br><br>position of dye shows pathway / AW ; | | [max 4] |
| | | | **[Total 14]** |
| 3 (a) | **P** = scapula<br><br>**Q** = humerus ;<br><br>**R** = ulna ; | **A** shoulder blade | [3] |
| (b) | hinge ; | **A** synovial joint | [1] |
| (c) | ref. antagonistic pair (of muscles) ;<br><br>triceps / extensor / or description of position contracting ;<br><br>pulls on R ;<br><br>biceps / flexor relaxing ;<br><br>muscles attach to bones by tendons ; | | [max 3] |
| | | | **[Total 7]** |

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