



BIOLOGY

0610/53

Paper 5 Practical Test

May/June 2017

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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This document consists of **6** printed pages.

Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- **ecf** credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- () the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

| Question | Answer | Marks | Guidance |
|----------|---|----------|--|
| 1(a) | table with 2 columns ; column 1 heading 'vegetable extract' column 2 headed volume of iodine and column 2 units – cm ³ ; correct trend ; | 3 | |
| 1(b) | to allow iodine to change colour ; | 1 | A as an indicator |
| 1(c) | volume of vegetable extract ; volume / concentration of starch solution ; concentration of iodine ; temperature; mixing time; | 2 | I amount R volume iodine solution |

| Question | Answer | Marks | Guidance | | | | | | | | | | | | | | |
|--|--|--------------------|---|---------------|--|--|----------------------------------|----------------------------|--|-------------------------------|--|------------|---------------------------|--|----------------------|---|---|
| 1(d) | <table border="1"> <tr> <td>source of error ;;</td> <td>improvement ;;</td> </tr> <tr> <td>contamination</td> <td>washing all apparatus / use new syringes</td> </tr> <tr> <td>overshoot of end-point / adding too much iodine / many drops</td> <td>add smaller quantities of iodine</td> </tr> <tr> <td>determination of end-point</td> <td>allow sufficient time for colour to change / use colorimeter / colour standard</td> </tr> <tr> <td>change in vitamin C with time</td> <td>test same time after extraction for each</td> </tr> <tr> <td>no repeats</td> <td>repeat each concentration</td> </tr> <tr> <td>AVP e.g. difficult reading scale coloured vegetable extracts</td> <td>AVP e.g. use burette</td> </tr> </table> | source of error ;; | improvement ;; | contamination | washing all apparatus / use new syringes | overshoot of end-point / adding too much iodine / many drops | add smaller quantities of iodine | determination of end-point | allow sufficient time for colour to change / use colorimeter / colour standard | change in vitamin C with time | test same time after extraction for each | no repeats | repeat each concentration | AVP e.g. difficult reading scale coloured vegetable extracts | AVP e.g. use burette | 4 | improvement must relate to given error A subjective colour change |
| source of error ;; | improvement ;; | | | | | | | | | | | | | | | | |
| contamination | washing all apparatus / use new syringes | | | | | | | | | | | | | | | | |
| overshoot of end-point / adding too much iodine / many drops | add smaller quantities of iodine | | | | | | | | | | | | | | | | |
| determination of end-point | allow sufficient time for colour to change / use colorimeter / colour standard | | | | | | | | | | | | | | | | |
| change in vitamin C with time | test same time after extraction for each | | | | | | | | | | | | | | | | |
| no repeats | repeat each concentration | | | | | | | | | | | | | | | | |
| AVP e.g. difficult reading scale coloured vegetable extracts | AVP e.g. use burette | | | | | | | | | | | | | | | | |
| 1(e)(i) | <p>L: 25.00 ;</p> <p>N: 62.5 ;</p> <p>correct number of decimal places on both ;</p> | 3 | | | | | | | | | | | | | | | |
| 1(e)(ii) | <p>axes labelled and units;</p> <p>even scale to fill more than half of printed grid ;</p> <p>plot three / four points correctly ;</p> <p>line of best fit / trend line ;</p> | 4 | ecf candidate result for 1(e)(i) | | | | | | | | | | | | | | |

| Question | Answer | Marks | Guidance |
|-----------|--|----------|---|
| 1(e)(iii) | mark volume of iodine used on (y axis of) graph / extend horizontally and extend line vertically from plotted point to x axis ; correct reading from graph on answer line ; | 2 | |
| 1(f) | range of temperatures ; values for temperatures stated ; time at each temperature ; use of water bath / named method ; description of extracting juice ; detail of use of iodine drops / volume / addition of starch for end point ;; at least two repeats ; (controlled variables) heating time / same type of vegetable / all samples from same vegetable ; relevant reference to safety ; | 6 | minimum of three at least one above 50 |

| Question | Answer | Marks | Guidance |
|-----------|---|-------|--|
| 2(a) | <i>any four from:</i> drawing with clear outline ; scaled to fit more than half the space ; shape 5 / 6 sides for both ; detail showing 3 / 4 layers with no shading and no cells ; | 4 | |
| 2(b)(i) | length of PQ = 80 mm ; (x)64 ;; | 3 | $\pm 1\text{mm}$ $(80) \div 1.25$ |
| 2(b)(ii) | plane of section ; AW magnification ; number of villi different; | 2 | |
| 2(c)(i) | A: 3 B: 9 C: 11 ; | 1 | A 2 instead of 3 for A 3 correct answers = 1 mark |
| 2(c)(ii) | 30 °C ; has highest rate of reaction / AW ; | 2 | |
| 2(c)(iii) | it is much higher / different than trial 1 and 3 / AW ; | 1 | |
| 2(c)(iv) | (IV) temperature ; (DV) rate of reaction ; | 2 | |