Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/52**

Paper 5 Practical Test **May/June 2019**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

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

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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Question	Answer	Marks	Guidance
1(a)(i)	four measurements in which the starting temperature for warm water is higher than the starting temperature for cool water **;**	**1**	
1(a)(ii)	table drawn with minimum two columns and a header line **;** appropriate column / row headings, with unit **;** both times recorded in seconds **;** suitable trend **;**	**4**	i.e. test-tube / temperature with warm and cool in the data cell OR temperature / °C, **and** time / s
1(a)(iii)	at higher temperatures the methylene blue became, colourless / disappeared, more quickly / AW **;**	**1**	
1(a)(iv)	volume / amount / type of yeast (suspension) **;** number of drops / concentration / amount / type, of methylene blue / indicator / AW **;** idea of equilibration time in water-bath / beaker **;** depth / amount / type / volume / height / AW, of oil **;**	**2**	
1(b)(i)	*error from Table 1.1* temperature (of the water-bath) not controlled / temperature changes / AW **;** *improvement* thermostatically controlled water-bath / maintain water-bath temperature / insulation of the beaker **;**	**2**	

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Question	Answer	Marks	Guidance
1(b)(ii)	*error step 15* **1** subjective / difficult to judge when the colour had disappeared / qualitative **;** **2** idea that both tubes are observed at the same time **;** **3** the indicator did not change within the ten minutes **;** *improvement* **1** compare to, a test-tube containing yeast with no methylene blue / test-tube that had already changed colour / use a colorimeter / colour standard **;** **2** idea that they should conduct each experiment at different times **;** **3** measure for more than 10 minutes or dilute the methylene blue or use a different dye **;**	**2**	
1(c)	hydrogencarbonate / bicarbonate **;** yellow or orange colour **;** OR limewater **;** goes cloudy / milky / white **;**	**2**	

Question	Answer	Marks	Guidance
1(d)	*independent variable:* at least <u>two</u> different concentrations of ethanol **;** *dependent variable:* measuring the time taken for methylene blue to decolourise **;** *constant variables:* two from **;;** same temperature same pH same volume of ethanol (solution) same volume / amount / concentration of sugar one from **;** same volume / amount / concentration / type, of yeast same volume / amount / concentration, of methylene blue / indicator same volume / depth of oil *methodology* idea of leaving to equilibrate at set temperature **;** use of a water-bath / insulation to maintain one temperature **;** detail of a comparison / control e.g. test with no ethanol / yeast, present **;** two or more repeats / three or more trials **;** *safety* relevant safety e.g. gloves / goggles / no flames **;**	**6**	**A** suitable alternative methods

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Question	Answer	Marks	Guidance
2(a)(i)	outline – clear continuous line around stigmatic disc ; size – larger than 70 mm ; details: nine stigmatic rays shown as double lines ; circle approximately one third of the way out from the centre of the stigmatic disc ;	**4**	
2(a)(ii)	length of line **PQ** 26 mm / 2.6 cm ±1 mm ; 16 mm / 2 cm ;;	**3**	
2(b)(i)	60(%) ;;	**2**	
2(b)(ii)	**A**(xes) – labelled ; pH and percentage germination **S**(cale) – suitable scale and plots occupy at least half the grid in both directions ; **P**(lot) – correct plots ± half a small square ; **L**(ine) – suitable line ;	**4**	
2(b)(iii)	percentage (germination) increases and then decreases ; peaks at pH 6 / highest percentage of (germination) is at pH 6 ;	**2**	**A** optimum at pH 6
2(b)(iv)	(test at pH values at) smaller intervals ; between pH 5 and 7 or 5 / 6 or 6 / 7	**2**	
2(c)	grind up seeds / AW ; add Benedict's (reagent/solution) ; heat ; red / orange / yellow / green, if reducing sugars present ;	**3**	

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