Mark Scheme (Results)

January 2019

Pearson Edexcel International Advanced Level
In Biology (WBI03) Paper 01
Practical, Biology and Research Skills

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.

- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.

- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.

- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
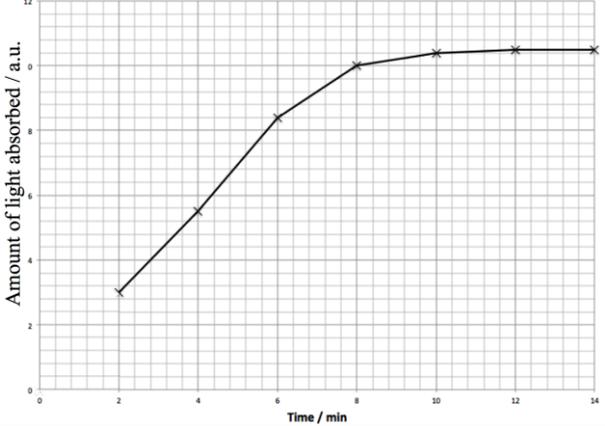
Question Number	Answer	Additional Guidance	Mark
1(a)	1. formation of glycosidic bonds (between glucose / alpha glucose) ; 2. by condensation (reaction) / loss of water (molecule) ;	**IGNORE** 1-4 and 1-6 bonds **NOT** beta glucose	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	amount of light absorbed / absorbance ;	**ACCEPT** amount of starch formed	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	{(glucose) solution without {extract / filtrate / eq} / (glucose) solution with boiled {extract / filtrate} ;		**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(iii)	suitable temperature quoted with units ;	between 10°C and 40°C **ACCEPT** a stated correct range *e.g.* 20-30°C	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(iv)	1. high temperature increases kinetic energy / collisions of {molecules / enzyme / substrate / ES complexes} ; 2. high temperature causes denaturation ; 3. 4. (sensible / appropriate) description of effect on absorbance / starch synthesis	**MP1 ACCEPT** converse point for a low temperature	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	A. axes right way round (x = time y= amount of light absorbed) ; L axes correctly labelled, and with units ; (x = time / min y= amount of light absorbed / a.u.) ; P correct plotting on appropriate linear scales ; S line joining points, accurately ruled :	**Sample graph** 	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(c)(ii)	1. starch is made at a {constant rate / eq} {at the start / until stated sensible time} ; 2. at start / between 0 mins and stated sensible time {glucose / substrate / eq} concentration is {in excess / eq} ; 3. then {rate / eq} {goes down / drops to zero} 4. because {glucose / substrate / eq} concentration is {limiting / eq} / has all been used / equilibrium is reached} ;	ACCEPT ref to changes in absorbance if clearly linked to starch concentration anywhere in answer	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(c)(iii)	1. the experiment should be repeated (under the same conditions) ; 2. idea of {finding / calculating / eq} {standard deviation / standard error / range} ;	IGNORE plot {standard deviation / standard error / range}	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(d)	1. in synthesis, the amount of light absorbed rises, in digestion it falls ; 2. digestion is faster than synthesis / eq ;	**ACCEPT** in synthesis direct relationship between time and amount of light absorbed, in digestion it is inverse. **In** synthesis it is positive correlation, in digestion it is negative. **ACCEPT** correct numerical comparison, must be a time element. No mark for simply quoting data unless it is linked to the same time period for both.	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	1. Tamoxifen binds to oestrogen receptors ; 2. therefore stops oestrogen from binding with these receptors ; 3. Anastrozole stops conversion of androgens to oestrogen ; 4. therefore reduces circulating oestrogen ;		

	5. reducing growth of cancer (cells) ;		**(3)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	1. mastectomy ; 2. and 3. Credit further details from para 11 ;;	e.g. remove of all breast tissue, this can reduce risk by up to 90%, stops subsequent spread of cancer, can cause bleeding, infections, scars, effect of sexuality, cannot breastfeed, can cause depression.	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(b)	1. suitable {bar graph / table / pie chart} drawn ; 2. four {bars / rows / columns / cells / segments} ; 3. {axes / headings / segments} correctly labelled ;		**(3)**

Question Number	Answer	Additional Guidance	Mark
2(c)(i)	1. part number / volume / names of other authors;		**(1)**

Question Number	Answer	Additional Guidance	Mark
2(c)(ii)	1. all 6 elements present with no extras ; 2. order correct ; 3. reference has name followed by initial and {et al / others} ;	e.g. Shih, V. et al (2012) Economic Evaluation of Anastrozole Versus Tamoxifen for Early Stage Breast Cancer in Singapore, Value in Health Regional Issues (46-53). OR without the brackets **ACCEPT** Vivienne, S. et al **ACCEPT** vol and/or {part/issue} **IGNORE** pp **ACCEPT** how ever many elements present (above 1)	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(d)	Any three of: hot flushes, vaginal dryness, headaches, fatigue, blood clots, vaginal bleeding ;	IGNORE more than first three unless wrong.	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(e)	1. 12.96 – 12.87 / 0.09 (years for $17 597) ; 2. so 1 year would need 1 ÷ 0.09 × $17 597 = $195 522 ;		**(2)**

Question Number	Answer	Additional Guidance	Mark
2(f)(i)	1. the high cost of modern medical treatment ; 2. (so) its unavailability in poorer countries / eq ;		**(2)**

Question Number	Answer	Additional Guidance	Mark
2(g)	1. (mean survival with) Anastrozole is {as good as / slightly better than} Tamoxifen ; 2. Anastrozole gives rise to fewer side effects / eq ; 3. mastectomy has many side effects / eq ;		**(2)**