SCOTTISH QUALIFICATIONS AUTHORITY

2006 Biology

Standard Grade – Credit

Finalised Marking Instructions

Standard Grade Biology 2006 – Additional marking notes

Please use these notes alongside the finalised **'VERSION 2 MARKING INSTRUCTIONS'**

Markers Meeting

Do take clear notes of all decisions taken and use them in your marking.
Do bring up reasonable different interpretations of a question which may lead to different acceptable answers.
Do provide other responses illustrating good biology.
Do only bring up alternative responses you have actually seen.
Do try to form an idea of the minimal acceptable answer based on the marking instructions and any discussion.

Do not bring up obviously different ways of saying the same thing.
Do not bring up repeated examples of clearly incorrect answers.
Do not raise issues not directly concerning the marking instructions – put them in your report.

During marking

There are **no half marks**.
In the marking instructions, if a word is underlined then it is essential; (bracketed) then it is not essential.
Answers separated by / are alternatives.

Negation. *A correct answer can sometimes fail to gain the mark if it is negated. This happens when:*
An extra **incorrect answer** is given together with the correct one.
Additional incorrect information is given which contradicts the correct answer, demonstrating a misunderstanding of the question. (Additional unrequired information will not negate a correct answer if it does not contradict that answer).

Do accept chemical formulae instead of chemical names.
Do accept subscript, superscript and normal script when used to identify generations in genetic crosses.
Do accept incorrect spelling if it looks or sounds reasonably correct – unless it could be confused with another biological term or is an amalgam of two or more words.
Do try to make a decision if you see a response not discussed at the markers meeting. Make a note of your decision and use it if the same response is seen again.
Do put 0 in **every** mark box where zero marks have been awarded.
Do check the totalling of the script marks carefully.

Do not make any written comments on the scripts. Use ticks, crosses, underlining, etc. to indicate marking decisions.

Referring scripts

Refer scripts to the Principal Assessor (*PA Referral*)) only in extreme cases of indecision over an answer. A relevant referral form must be completed and included with the script. The script should be labelled ***PA Referral***

Refer scripts for S*pecial Attention (M)* if there is suspected malpractice or offensive remarks on the script. A report should be written on a separate piece of paper and included with the scripts. The script packet should be labelled **S*pecial Attention (M).***

STANDARD GRADE BIOLOGY - 2006 CREDIT LEVEL MARKING INSTRUCTIONS VERSION 2

Qu	Acceptable answer	Mark	Unacceptable answer
1(a)	(i) **6**	**1**	
	(ii) **8** and **10**	**1**	
	(iii) **2** and **16**	**1**	
(b)	(i) The population remained constant for 2 hours / the bacteria started to increase after 2 hours then increased up to 16 hours, then remained constant Correct pattern but one or both times missed then lose 1 mark three points = two points =	**2** **1**	
	(ii) Lack / shortage of food / lack of oxygen / accumulation of wastes Any two, 1 mark each	**2**	food etc without qualification
	(iii) Any line which shows the same start as the original up to 2 hours and then shows a continual increase but which remains below the original or which reaches the same or lower maximum at a later time.	**1**	graphs which do not continue for 24 hours
(c)	(i) spores / endospores	**1**	
	(ii) produce an even distribution of bacteria / spreads out the bacteria / avoid taking an unrepresentative sample	**1**	mixes the bacteria / to make the results valid

Qu	Acceptable answer	Mark	Unacceptable answer
2(a)	(i) carrots and spinach — both needed =	**1**	
	(ii)		

	optimum germination temperature (°C)
carrots	20
cauliflower	20
okra	25
spinach	5

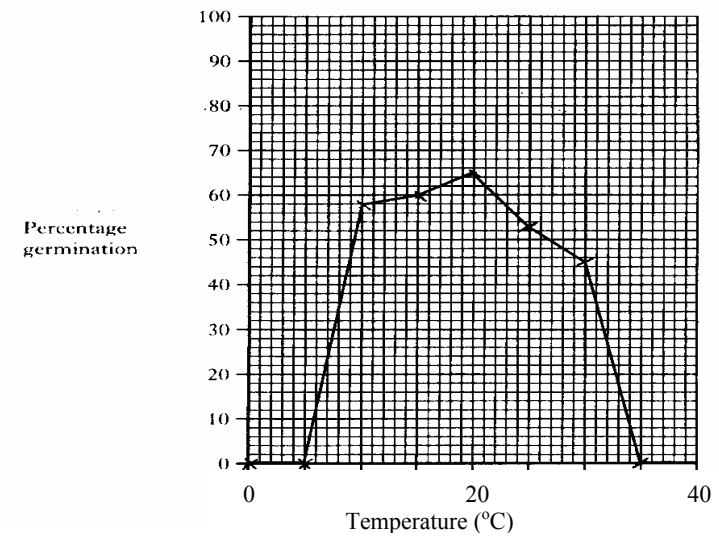
Correct crop names + column heading with units = **1**

Correct data = **1**

(iii) okra **1**

(iv) 1250 **1**

(v)



Correct label + scale of 0, 40 + one other value for x axis = **1**

Correct plot + line = **1**

Qu	Acceptable answer	Mark	Unacceptable answer
(b)	embryo / embryo root / radicle / embryo shoot / plumule	**1**	root / shoot
(c)	As temperature increases, percentage germination increases up to an optimum / a specific temperature. Above this temperature, percentage germination decreases. ('As temperature increases it increases then decreases' = 1) (Accept answers which include specific named plants from table and their correct optimum temperatures)	**1** **1**	
3(a)	Growth of pollen tube Passage of nucleus / male gamete along tube } three points = Joining of nucleus / male gamete with female gamete in ovule / ovule nucleus } one / two points = (Don't penalise twice for an incorrect description)	 **2** **1**	Pollen grain moves down tube
(b)	Maintains desirable characteristics / identical to parents No vulnerable stages / Allows growth of otherwise weak varieties Avoids need for pollination etc / Only one parent needed / Allows reproduction of sterile varieties Conserves endangered varieties Rapid production of new plants Any two from different lines 1 mark each	 **2**	cheaper / produces new varieties / removes undesirable characteristics / you can choose the characteristics

Qu	Acceptable answer	Mark	Unacceptable answer
4(a)	If there is no external water for sperm to swim / To provide fluid for sperm to swim / Sperm need fluid to swim	**1**	So sperm can reach the egg / for protection
(b)	glucose / amino acids / oxygen / water / antibodies / alcohol / viruses / drugs / vitamins (or example) / minerals (or example)	**1**	food / nutrients
(c)	The more parental care taken, the fewer eggs are produced. Accept converse	**1**	
5(a)	(i) peristalsis (ii) A **contracted** B **relaxed** both needed =	**1** **1**	
(b)	salivary gland / pancreas / small intestine / liver any one	**1**	stomach / mouth / intestine
(c)	(i) vitamin C (ii) vitamin B3 + zinc both needed = (iii) 5 : 4	**1** **1** **1**	
(d)	(i) 12 (ii) 75	**1** **1**	

Qu	Acceptable answer	Mark	Unacceptable answer
6(a)	(i) 1. Move towards of food 2. Move away from light / move towards dark 3. Move away from heat — Any two different explanations, 1 mark each	**2**	
	(ii) Explanation 1. To get food / to get energy / to be able to feed Explanation 2. To avoid predators Explanation 3. To remain cool / To remain at a suitable temperature / To avoid becoming too hot — must correspond to answers in part (i)	**1**	
	(iii) Remove food / put food at both ends Remove lamp / provide even illumination / put a lamp at both ends Use a heat shield — must correspond to answers in part (i)	**1**	
(b)	(i) Avoids harsh winters / time of food shortage / allows longer days for feeding	**1**	Better for breeding / prefer warmer conditions
	(ii) rhythmical / rythmic	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
7(a)	29.6	**1**	
(b)	(i) osmosis (ii) Water moved into the sultanas / cells from a high to low concentration / because there was a lower water concentration in the sultanas / because there was a higher water concentration outside the sultanas } both points needed =	**1** **1**	
(c)	☐ ☐ ☑ To remove external water ☐	**1**	
8(a)	3. Chromosomes or chromatids attach to spindle fibres / Chromosomes or chromatids become arranged / line up / gather at equator / middle of cell	**1**	chromosomes or chromatids separate
(b)	So each cell has full set of information / genes / so no information / genes are lost / so each cell has the same information / so each cell is genetically identical	**1**	Answers referring to a next generation and preventing mutations such as Down's Syndrome So the cells are the same. So no characteristics are lost.

Qu	Acceptable answer	Mark	Unacceptable answer
9(a)	Driving them north / reduction in numbers	**1**	Fish move north / away Plankton are killed
(b)	cod / salmon / sand eels any two =	**1**	
(c)	Able to live in warmer water / Increase in temperature suits these species / less competition The water is becoming warmer / they are used to warmer water	**1**	They don't depend on plankton It's too hot in their original area The water is warm
(d)	Fewer sand eels means less food for the birds	**1**	
(e)	1. 1980s water was higher temperature / warmer 2. 1980s water was higher salinity / more saline / saltier } both needed = Accept converse for 1970s water	**1**	Different temperature and different salinity

Qu	Acceptable answer	Mark	Unacceptable answer
10(a)	<table><tr><td></td><td>E</td></tr><tr><td></td><td>A</td></tr><tr><td>information / impulse sent along relay / intermediate / connector nerve cell</td><td></td></tr><tr><td></td><td>D</td></tr><tr><td></td><td>F</td></tr></table> five correct = three / four correct =	**2** **1**	
(b)	(i) 2·6 (ii) As the light increases, the pupil diameter decreases / As the light decreases, the pupil diameter increases / The brighter it is the smaller the pupil / The darker it is the bigger the pupil (iii) Increases reliability of results / reduces the effect of atypical results / one result may be atypical / makes results more representative.	**1** **1**	As the distance of the torch increases, the pupil diameter decreases Makes results reliable Makes results more accurate / valid
11(a)	selective breeding selective breeding mutation } accept selective breeding + mutation three correct = two correct =	**2** **1**	
(b)	Name of any suitable animal Description of appropriate improved characteristic } both needed =	**1**	Examples of natural selection Non-specific answers eg health / fitness

Qu	Acceptable answer	Mark	Unacceptable answer
12(a)	(i) three correct = **2** one / two correct = **1** (ii) **I** / **J** **1** (iii) **Variation** Discontinuous **Reason** There are only two possibilities / groups There is a limited number of possibilities / groups There is no range of possibilities / A person either has the disease or hasn't } both needed **1**		Use of other letters / symbols Description of phenotypes
(b)	allele	**1**	
13(a)	(i) Beaker **B** Reason Colour change was faster / there were more cells in contact with the glucose } both needed **1** (ii) Any time greater than 9 minutes and less than 12 minutes. **1** (iii) same temperature / same quantity of yeast cells / same concentration of glucose solution / same volume of glucose solution / same size of beaker / same concentration of dye / same volume of dye any two, 1 mark each **2**		Level of glucose / light / time / type of dye
(b)	Easily separated from the product / Can be reused / Allows continuous flow processing	**1**	Faster / more product / less waster Doesn't have to be sterilised
(c)	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ four rows correct = **2** two / three rows correct = **1**		

Qu	Acceptable answer	Mark	Unacceptable answer
14(a)	(i) It reduced the thickness / It made it more runny / It made it thinner	**1**	
	(ii) It contains micro-organisms which produce cellulase / It contains cellulase	**1**	
(b)	(i) The best conditions / temperature for the enzyme to work. The conditions / temperature in which the enzyme works best.	**1**	The best condition
	(ii) It only acts / works on / breaks down cellulose / one substrate It only catalyses one reaction It will not act / work on / break down anything else	**1**	
15(a)	(i) 0.6	**1**	
	(ii) 15	**1**	
(b)	(i) circulatory system / blood system / heart	**1**	skeleton / nervous system
	(ii) Less lactic acid produced / lactic acid is removed faster / smaller oxygen debt created during exercise / oxygen debt reduced faster / oxygen absorbed into blood faster	**1**	Answers relating to the heart or circulatory system

[END OF MARKING INSTRUCTIONS]