SCOTTISH QUALIFICATIONS AUTHORITY

2006 Biology

Standard Grade – General

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.

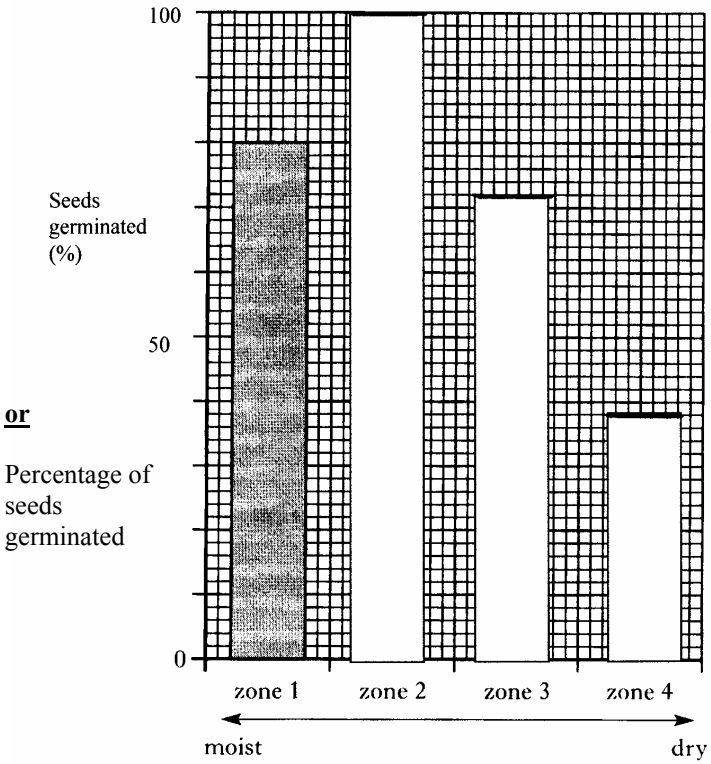
Referring scripts

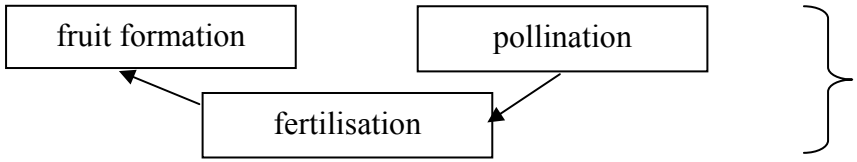
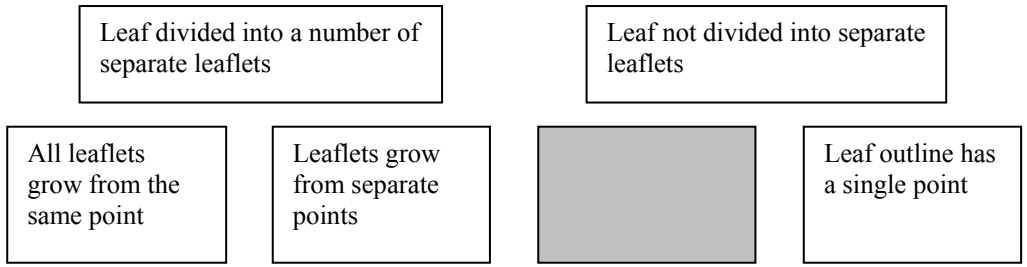
Refer scripts to the Principal Assessor (*PA Referral*)) only in extreme cases of indecision over an answer. A relevant referral form must be completed and included with the script. The script should be labelled ***PA Referral***

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 GENERAL LEVEL MARKING INSTRUCTIONS VERSION 2

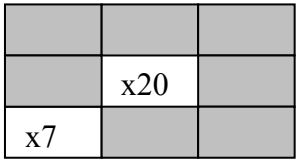
Qu	Acceptable answer	Mark	Unacceptable answer
1(a)	(i) **A** and **E** any order (ii) **B** (iii) **F**	**1** **1** **1**	
(b)	a group / number of individuals of one / the same species	**1**	……. type / kind / sort of organisms …….. same species of animal / plant amount of …….. mass of ……
(c)	(i) 5	**1**	
	(ii) Several measurements added together. Total divided by number of measurements taken } both steps required =	**1**	Any suggestion of averaging measurements from different quadrats. Add up measurements and divide by 5.
	(iii) Factor (soil) moisture Reason Ling found at lower moisture levels than Bell / Bell found at higher moisture levels than Ling Ling found at moisture levels of 5 units or less, Bell found at 5 units or more./ Ling and Bell found over full range of other factors / pH and temperature factor + reason =	**1**	Bell heather prefers moister conditions Converse Incorrect quoted moisture values Statements without comparison
	(iv) Several / many quadrat positions should be used. Quadrat positions should be made randomly / along a transect } all points = Plants in quadrat recorded /counted 1 / 2 points =	**2** **1**	Take a reading from the quadrat

Qu	Acceptable answer	Mark	Unacceptable answer
2(a)	 **or** Percentage of seeds germinated		
	(i) scale of **100** plus **one other value** =	**1**	
	(ii) correct label with units =	**1**	Number of seeds
	(iii) bars correctly plotted **with tops** for zones 2, 3 and 4 =	**1**	bars without tops tops without bars
(b)	(i) As soil moisture increases up to 70 cm^3 per 100 g / optimum level, percentage germination increases. Above this, percentage germination decreases. (Accept converse) As soil moisture increases, percentage germination increases then decreases = 1	**1** **1**	Cause and effect wrong way round negates Incorrect quoted value or units
	(ii) Appearance of root / shoot / radicle / The seed has sprouted.	**1**	Presence of maltose Seed coat splits
	(iii) 1. suitable temperature / warmth / heat 2. oxygen both needed	**1**	Water / moisture / light / pH / space / air / temperature

Qu	Acceptable answer	Mark	Unacceptable answer
3(a)	(i) **E**	**1**	
	(ii) Name **stigma**	**1**	
	Function **receives / traps / catches pollen / male gametes.** **pollen sticks to it**	**1**	where pollen lands / holds pollen / growth of pollen tube
	(iii) Letter **F**	**1**	
	Name **ovary**	**1**	
(b)	(i) 	**1**	
	(ii) **sexual** **pollination**	**1**	
4(a)	Leaf A Leaf B Leaf C Leaf D **Lime** **Sycamore** **Horse chestnut** **Ash**	4 correct = **2** 2 / 3 correct = **1**	
(b)		8 correct = **2** 5 / 6 / 7 correct = **1**	Incomplete or altered statements

Qu	Acceptable answer	Mark	Unacceptable answer
5(a)	(i) **Z** (ii) **1 : 0 : 4** (iii) **Z**	**1** **1** **1**	
(b)	growth / repair / cell division	**1**	energy / warmth / movement – all negate reproduction / chemical reactions
(c)	small intestine / ileum / villi	**1**	intestines
6(a)	water	**1**	
(b)	increased / more	**1**	incorrect quoted values
(c)	Week 1 **8** Week 2 **10** Week 3 **12** } all correct =	**1**	
(d)	2.5	**1**	
7(a)	A	**1**	
(b)	**6** and **9**	**1**	
(c)	Increases to maximum at pH7 Then decreases (must mention pH7 to gain both marks, ∴ ' increases then decreases' = 1 mark)	**1** **1**	
(d)	(i) It speeds up / changes the rate of a chemical reaction. It is unchanged / can be used again after the reaction } both points needed (ii) protein / amino acids	**1** **1**	 peptides

Qu	Acceptable answer	Mark	Unacceptable answer
8(a)	(i) renal artery	**1**	
	(ii) ureter	**1**	
	(iii) store / receive urine	**1**	Store waste / water. Contains / passes
	(iv) urea	**1**	urine - negates
(b)	(i) Water gain = water loss in normal (and colder) conditions / Water gain (usually) = water loss The totals are the same	**1**	Water loss always = water gain
	(ii) In colder temperatures: water loss in sweat decreases and water loss in urine increases / In warmer temperatures: water loss in sweat increases and water loss in urine decreases / In colder temperatures: water loss in sweat decreases and water loss in urine decreases / Accept converses and correct combinations which compare urine and sweat production at one temperature to the other.	**1**	
	(iii) 5200 (Accept correct answer in calculation space if units are included)	**1**	
	(iv) Increase volume of drink / By drinking	**1**	Produce more ADH From food } don't negate

Qu	Acceptable answer	Mark	Unacceptable answer
9(a)	(i) A **(cell) wall** B **vacuole** C **nucleus** D **cytoplasm** 4 correct = 2/3 correct =	**2** **1**	cell sap
	(ii) controls cell activities / reactions / development / growth / division / Controls the cell contains / passes on inherited material / genes / genetic information / chromosomes / DNA	**1**	The brain of the cell / Controls entry and exit of materials / Contains information / Control centre
(b)	(i) oxygen / carbon dioxide / glucose / amino acids / water / salts / sugar	**1**	
	(ii) Higher (concentration) outside cell / Lower (concentration) inside cell / High (concentration) outside and low (concentration) inside	**1**	Answers with no comparison / Answers referring to a named substance / Moves from a high to a low concentration
(c)	 both correct =	**1**	Answers with missing 'x'
(d)	(i) 0.1/ $\frac{1}{10}$ / .1	**1**	Answers written in calculation space with wrong units
	(ii) Plant cells are larger / longer / bigger **or** Animal cells are shorter / smaller	**1**	Plant cells have larger surface area / Plant cells are larger than human cells

Qu	Acceptable answer	Mark	Unacceptable answer
10 (a)	fungus and alga	**1**	
(b)	The presence or absence of certain lichens can be used to give a measure of sulphur dioxide levels.	**1**	Lichen species differ in their ability to tolerate pollution. Any additional sentence
(c)	It produces / is a source of food / energy / oxygen / sugar (Accept answers where the food etc is being produced for the fungus / lichen / it / them)	**1**	Algae can photosynthesise Food produced for the alga
(d)	7	**1**	
(e)	(i) anti-bacterial / antiseptic / contains usnic acid (ii) slow growth rate / grow too slowly	**1** **1**	usnic acid
11 (a)	bronchus **B** windpipe **A** air sac **D** bronchiole **C** 4 correct = 2/3 correct =	 **2** **1**	
(b)	carbon dioxide	**1**	
(c)	(i) 100 (ii) as the level of exercise increases, breathing rate increases / as it increases, breathing rate increases / as the level of exercise increases, it increases the more / the harder you exercise, the more you breathe (iii) increases reliability of results / makes results reliable / reduces the effect of atypical results / one result may be atypical / makes results more representative	**1** **1** **1**	 it increases / both increase as one increases, the other increases the more you breathe the more you exercise Prevents atypical results / for reliability Makes results valid / accurate

Qu	Acceptable answer	Mark	Unacceptable answer
12 (a)			

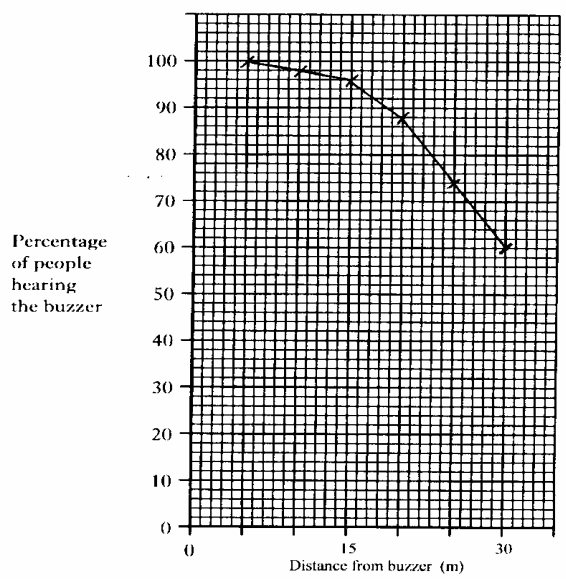
		vibrates in response to sound / picks up sound vibrations / picks up sound waves / causes middle ear bones to vibrate / turns sound into vibrations / passes vibrations to middle ear
B		
	semi-circular canals	
E	cochlea	
D		carries / transmits signal / impulse / message / information to brain

7 correct = **3**
5 / 6 correct = **2**
3 / 4 correct = **1**

picks up vibrations / amplifies vibrations / protects middle ear

Carries sound to brain

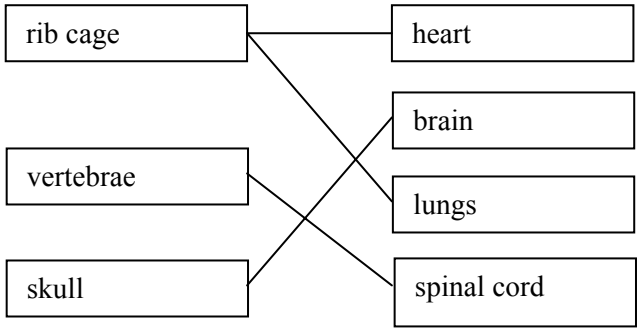
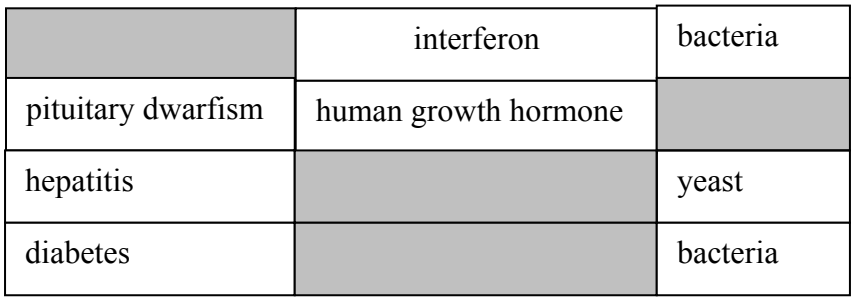
(b)

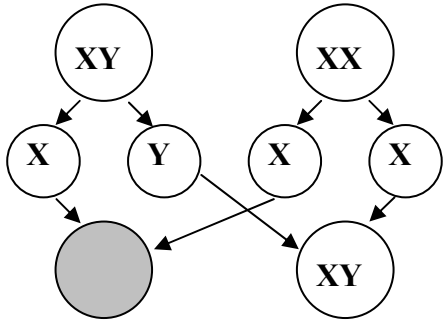
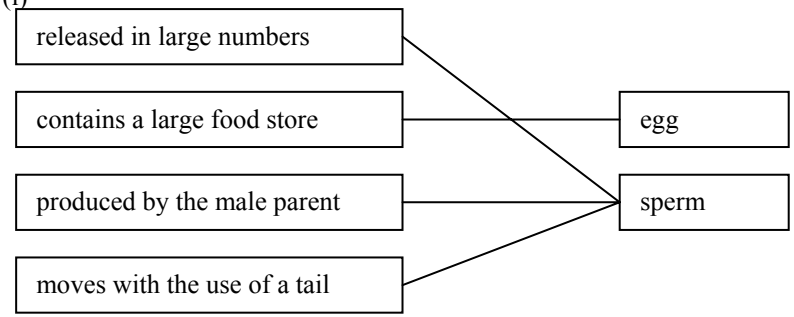


(i) correct label on x axis = **1**

(ii) scale of 30 / 35 + one other value on x axis = **1**

(iii) correct plot and line = **1**

Qu	Acceptable answer	Mark	Unacceptable answer
13 (a)	1. (provides) support / (acts as) framework / holds body up / gives body its shape / gives body its structure 2. (allows) movement / muscle attachment 3. makes blood cells any two different functions =	**1**	Gives strength / flexibility / stability
(b)	 4 correct lines = 2/3 correct lines = (Additional lines lose 1 mark each)	**2** **1**	
14 (a)	(1) 430 (ii) Mumps (iii) Fewer cases / decrease until 2001 then increases. Fewer cases / decreases then increases from 2001 Decreases / fewer cases then increases in 2002 decrease then increase = 1	**1** **1** **2**	 Answers referring to a specific disease …… increases from 2002
(b)	 4 correct rows = 2/3 correct rows =	**2** **1**	

Qu	Acceptable answer	Mark	Unacceptable answer
15(a)	(i)  Everything must be correct as stated for both marks Male parent XY =1 (ii) Female / girl	**2** **1**	
(b)	(i)  all correct = 2/3 correct = (Additional lines beyond 4 lose 1 mark each) (Accept 'egg' and 'sperm' written correct statements) (ii) gametes	**2** **1** **1**	Reproductive cells
(c)	one	**1**	
(d)	gene	**1**	allele

Qu	Acceptable answer	Mark	Unacceptable answer
16(a)	micro-organisms / bacteria / fungi / protists / protozoa / microbes / single-celled organisms / unicellular organisms / decomposers	**1**	enzymes
(b)	Provides air spaces / provides large surface area in contact with air or oxygen / there is oxygen in the spaces between the stones / there is air or oxygen in the stones / there is air or oxygen held in the stones / there is air or oxygen stored in the stones	**1**	
(c)	(i) methane / biogas (ii) renewable / reduces use of fossil fuels / won't run out / not finite / carbon neutral / produces less SO_2	**1** **1**	hydrogen Cheap / better for the environment / reusable
17(a)	unpasteurised	**1**	
(b)	reduces / slows / delays	**1**	Stops souring / prolongs souring /fewer bacteria
(c)	6.4	**1**	
(d)	<u>fermentation</u>	**1**	

[END OF MARKING INSTRUCTIONS]