2009 Biology

Standard Grade – Credit

Finalised Marking Instructions

Standard Grade Biology 2009 – 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 *Special Attention (M)*.

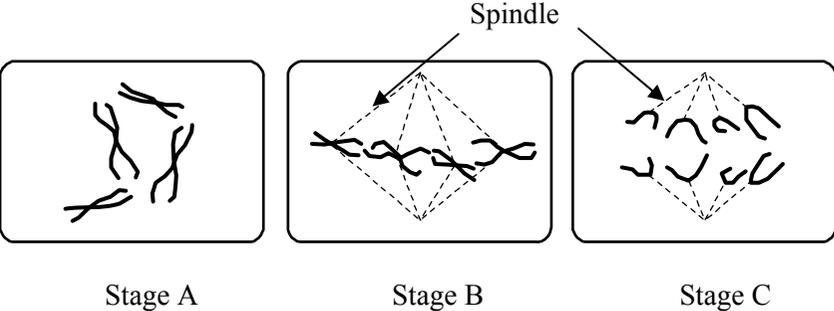| Qu	Acceptable answer	Mark	Unacceptable answer
1 (a) (i)	(A) → B remained steady / does not change B → D increased / information about B → C and C → D increasing D → remained steady / does not change three points = steady then increase then steady = 1 A → B steady then increase = 1 increased → D then steady = 1	**2**	Remains low Remains high
(ii)	no lack of food / territory lack of or no predators / lack of or no disease	**1**	Increase in food available Birth rate / death rate changes
(b) (i)	increase (in population) less or no competition for <u>food</u> / more <u>food</u> / <u>grass</u> for them or (population) stays the same more <u>food</u> for wallabies but more wallabies are eaten	**1**	
(ii)	decrease (in population) fewer prey / less <u>food</u> or (population) stays the same additional wallabies are eaten to make up for lack of rabbits	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer

2 (a)

coal burning 1 + 3	— waste can cause high levels of acid rain

waste must be sealed before it is stored

high volume of greenhouse gas production

Nuclear 2 + 4	— waste is dangerous for hundreds of years

four lines correct = **2**
two/three lines correct = **1**

Additional lines beyond four – lose one mark each

(b) (i)

	pH or PH	oxygen (O₂) Saturation (%)	Suspended solids (mg/1)
	7·9	91·5	4·0/4
	7·7	65	5·6
	8·0/8	94	6·0/6

twelve correct boxes = **3**
nine/ten/eleven correct boxes = **2**
six/seven/eight correct boxes = **1**

(columns can be in any order
accept units with figures)

If units wrong for a column count as 1 mistake

Oxygen   solids

Sat instead of saturation

(ii) Mains (Burn) — **1**

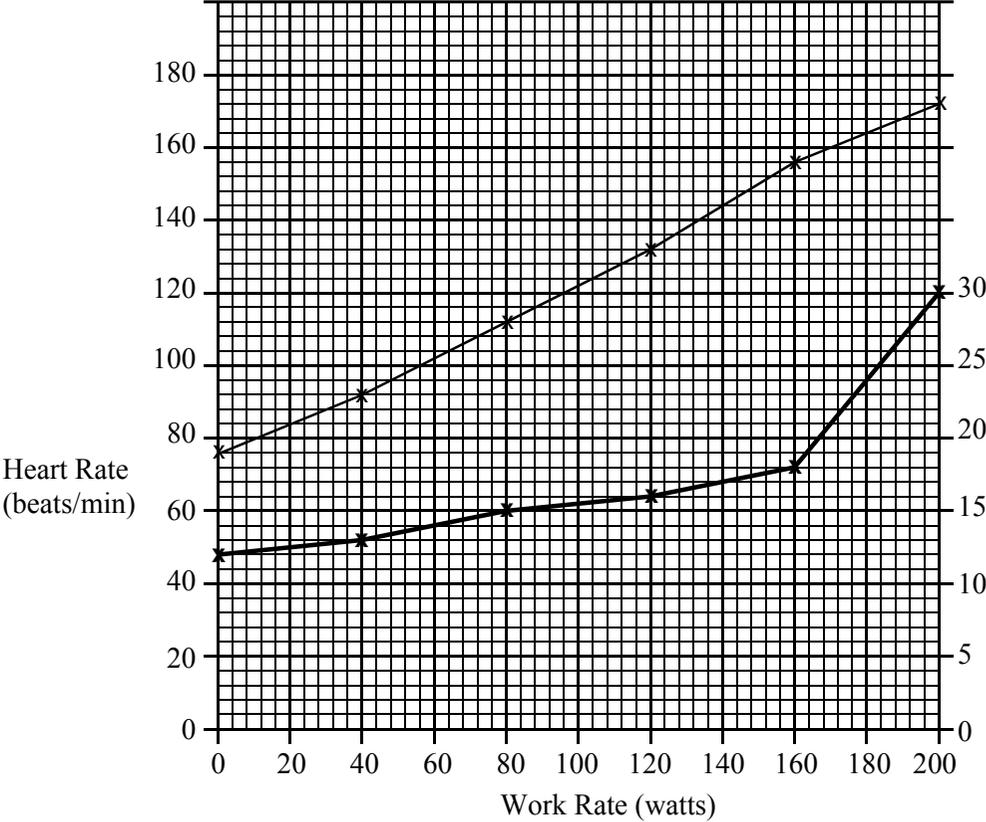| Qu	Acceptable answer	Mark	Unacceptable answer
3 (a)	anther – produces light <u>pollen</u> grains / produces lots of <u>pollen</u> / dangle / hangs outside (flower) so <u>pollen</u> is (easily) blown away stigma – large surface area or feathery to catch / trap <u>pollen</u> / hangs outside (flower) to trap <u>pollen</u> / exposed to wind blown <u>pollen</u>	**1** **1**	Hangs outside flower to catch the wind Plant instead of flower Loosely attached so pollen catches wind Hangs outside flower to catch the wind Feathery for pollen <u>to land on</u> Negates − talking about another method of pollination eg insects Negates − sticky
(b) (i)	4	**1**	
(ii)	sufferers not allergic to all pollen / different sufferers are allergic to different plants/pollen	**1**	Sufferers are allergic to more than one type of pollen / only allergic to one type of pollen Statements about months most people suffer allergies
(iii)	75600	**1**	
(c)	germination of pollen grain / growth of pollen tube / passage of pollen nucleus or male gamete to ovule or female gamete	**1**	Germination Pollen must reach ovary Growth of the tube

Qu	Acceptable answer		Mark	Unacceptable answer
(d)	plant sycamore / birch / ash (or equivalent)	dandelion / thistle / grass / willow / clematis (or equivalent)	**1**	Sycamore – leaves instead of wings
	description winged seeds (or equivalent) large surface area for wind to move them helicopter like	seeds with fine hairs (or equivalent) light and feathery umbrella like	**1**	
	Suitable named plant with no description or incorrect description =1 Wrong / no named plant with appropriate description =1 (For 2 marks, description must match the named plant)			
(e)	1 and 4 both needed =		**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
4(a)	1 **(go to) 4** 2 **Black <u>wing tip</u>** **(go to) 3** six correct boxes = **3** four/five correct boxes = **2** 3 **Wood White** two/three correct boxes = **1** 4 **White <u>wing tip</u>** **Red Admiral**		
(b) (i)	butterflies / it / they appeared earlier (in 2006) / appeared earlier in the month / sightings were / spotted / noticed earlier	**1**	Birds appeared earlier Isolated mention of 1 or 2 named butterflies sighted earlier
(ii)	indicator species	**1**	
5 (a) (i)	80 (accept answer not in table)	**1**	
(ii)	Humans have greater (survival rates) because of greater parental care / Humans have greater (survival rates) because of internal development / Humans have greater (survival rates) because of lower predation Identify animal and which has greater survival rate and reason eg trout have lower survival rates because… Accept converse for all	**1**	Reference to internal / external fertilisation – negates Humans have greater parental care
(b)	carbon dioxide / urea CO_2	**1**	Waste – not negating

Qu	Acceptable answer	Mark	Unacceptable answer
6 (a) (i)	osmosis	1	
(ii)	fresh (water)	1	
(b) (i)	burst / swell up and burst / goes turgid and bursts	1	It would die / explode / popping
(ii)	water is moving against a concentration gradient / from a lower to a higher water concentration / there is a higher water concentration in the vacuole than in the cytoplasm use of HWC and LWC	1	It's not diffusion because it's going through a membrane / pure water is collected in the vacuole
7 (a)	increases decreases decrease three correct = one/two correct =	2 1	
(b) (i)	A	1	
(ii)	E	1	

Qu	Acceptable answer	Mark	Unacceptable answer
(c) (i)	protein	**1**	
(ii)	glucose	**1**	
(d)	178·2	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
8 (a) (i)	Accept any clearly labelled spindle fibre in B or C Accept arrow indicating the pole	1	
(ii)	Chromosomes / chromatids reach poles / opposite ends of cell / spindle disappears formation of nuclei / formation of nuclear membrane	1	Division of cytoplasm Cell membrane forms Cells separate into 2 daughter cells
(b)	12·5	1	
(c)	so no loss of information or instructions / so (daughter) cells / they have all the necessary information or instructions / so daughter cells have the same information (as the mother cell) No loss of genes / genetic information / genetically identical	1	Mutation / abnormalities / defects / so daughter cell can undergo mitosis / so cells can carry out same tasks / clones / identical

Qu	Acceptable answer	Mark	Unacceptable answer
9 (a)	<table><tr><td>*Name*</td><td>*Name*</td></tr><tr><td>Cartilage</td><td>Synovial fluid</td></tr><tr><td>*Function*</td><td>*Function*</td></tr><tr><td>cushions or protects bones / shock absorber / absorbs impact / reduces friction / allows smooth movement / stops bones rubbing together</td><td>lubricates (joint) / reduces friction / allows smooth movement</td></tr></table> three correct = one/two correct =	**2** **1**	Rings of cartilage Prevents friction – negates a correct answer
(b)	To pass / transmit force or contraction of muscle to bone / to make bone move / to make limb move To pass / transmit movement of muscle to bone = 2 If they were elastic, force or contraction would not be passed / transmitted to bone = 1 and limb / bone would not move = 1	**1** **1**	

Qu	Acceptable answer	Mark	Unacceptable answer
10 (a)	1 4 6 7 all correct = two/three correct =	**2** **1**	Additional numbers beyond four – lose 1 mark each
(b) (i)	800	**1**	
(ii)	anaerobic respiration	**1**	Lack of oxygen
(iii)	Accept different scales which use at least ½ the grid but they lose the plot mark if points cannot be accurately plotted Scale can start at number other than zero as long as it is at origin correct scale (0, 200 / 180 plus at least one other value) and label = correct plotting and joining of points =	**1** **1**	

Qu	Acceptable answer	Mark	Unacceptable answer
(iv)	As work rate increases, breathing rate and heart rate increase / As work rate increases, they both increase / As it increases, breathing rate and heart rate increase Must refer to <u>rates</u> where terms are given Accept additional information about change of slope **if correct**	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
11 (a)	grit	**1**	
(b)	oxygen to allow aerobic respiration of bacteria / micro-organisms / to provide aerobic conditions for micro-organisms / to allow <u>complete</u> breakdown of sewage / organic matter	**1** **1**	
(c)	A variety of micro-organisms is needed to breakdown the <u>range of organic matter</u> / the <u>different substances</u> Different micro-organisms break down <u>different substances</u>	**1**	Use of "sewage" instead of different substance
(d)	heavy rain / flooding	**1**	Raining / earthquake
12 (a)	to feed / to get food	**1**	To replenish body reserves To get food for the chick
(b)	120	**1**	
(c)	puts it on the top of his feet / with his upwardly turned toes	**1**	Other steps taken to keep the egg warm (not negating)

Qu	Acceptable answer	Mark	Unacceptable answer
(d)	<table><tr><td></td><td></td><td>**1**</td><td>**2**</td><td>**3**</td><td></td><td>**4**</td><td></td><td></td><td></td><td>**5**</td><td></td></tr><tr><td>Jan</td><td>Feb</td><td>Mar</td><td>Apr</td><td>May</td><td>Jun</td><td>Jul</td><td>Aug</td><td>Sep</td><td>Oct</td><td>Nov</td><td>Dec</td></tr></table> five correct = three/four correct =	**2** **1**	Additional numbers lose 1 mark each
(e)	3 Accept 'wrong' answer based on number of months shown in table from 5 → 1	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
13 (a) (i)	☑ ☑ ☐	**1**	
(ii)	So only light from the cloth was recorded / So natural / outside light did not affect results. So no extra / other / excess light affects results / reading	**1**	So no light gets in to change results To stop light escaping To keep light out To control other variable
(b) (i)	30	**1**	
(ii)	£31·20	**1**	
(iii)	enzymes　　　　Answer must allow for range of enzymes ("Enzymes such as protease" would be ok)	**1**	Protease enzyme / biological catalyst
(iv)	enzymes are denatured	**1**	Temperature too high / not optimum Deformed etc

Qu	Acceptable answer	Mark	Unacceptable answer

14 (a)

Concentration of solid material (mg/1)

BOD (mg/1)

Month

Top line important
Side shading – more lenient
Shading matches given key

All bars plotted and shaded correctly = **1**

Qu	Acceptable answer	Mark	Unacceptable answer
(b)	As the concentration of solid material increases, the BOD increases / As the concentration of solid material decreases, the BOD decreases	**1**	…… the mass / amount of BOD increases ……but is always below it
(c)	1·75mg/1 ✓	**1**	

Qu	Acceptable answer	Mark	Unacceptable answer
15 (a) (i)	3 : 1	**1**	
(ii)	12 (accept a correct answer based on a wrong answer to (i))	**1**	
(iii)	3 : 2	**1**	
(iv)	Random or chance effect of fertilisation / sample size too small	**1**	
(b)	allele	**1**	
(c)	(individuals) can be placed into distinct groups / (variation) does not show a range of values between a maximum and minimum / (variation) shows clear cut differences / (characteristics) are in distinct categories or groups	**1**	Variation cannot be measured – negates Variation which does not change (negates) 2 distinct categories

[END OF MARKING INSTRUCTIONS]