Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

BIOLOGY

MARK SCHEME

This is a suggested, not a prescriptive, mark scheme.

Monday 23 January 2012

283122M29

Q.	Answer	Mark	Additional Guidance
1. (a)	nucleus	9	
(b)	pollen grain		
(c)	carbohydrate		
(d)	glucose and oxygen		
(e)	iodine solution		
(f)	competition for light		
(g)	gives birth to live young		
(h)	have a large surface area		
(i)	liver		
2. (a)	testes → production of sperm ovaries → production of eggs oviduct → usual site of fertilisation	2	2 marks for all 3 correct 1 mark for 1 or 2 correct
(b)	protection	1	
(c)	placenta	1	
3. (a)	food photosynthesis herbivores carnivores	4	1 mark for each
(b)	primary consumer: greenfly/caterpillar top carnivore: sparrowhawk	2	1 mark each
4. (a) (i)	protein	1	
(ii)	growth/repair	1	
(iii)	meat/fish/eggs	1	any suitable food high in protein

Q.	Answer	Mark	Additional Guidance
(b)	soften leaf in boiling water place leaf in boiling ethanol wash leaf add a few drops of iodine (solution) to leaf reference to correct colour change *safety:* care with boiling water and/or ethanol no naked flames near ethanol	**4**	answer must include at least one safety precaution in addition to wearing safety goggles
5. (a)	**A** brain **B** stomach **C** liver	**3**	
(b)	large surface area/alveoli good blood supply/vast capillary network moist walls thin walls (of alveoli)	**2**	any two suitable suggestions
(c)	5(%)	**1**	
(d)	B air breathed out through tube B (breathed in through tube A)/higher per cent of carbon dioxide in exhaled air	**2**	
(e)	moved/diffused into blood through alveoli transported by blood/round the body by red blood cells/haemoglobin to cells used in respiration	**4**	candidates may interpret this question in different ways credit answers which reflect a sound understanding of lung structure, gas exchange in the lungs and oxygen transport round the body

Q.	Answer	Mark	Additional Guidance
6. (a)	carbon dioxide + water ⟶ glucose + oxygen	**2**	deduct 1 mark for each error
(b)	1%: 0.4(g)/0.40(g) 1.5%: 0.5(g)/0.50(g)	**2**	
(c)	*sensible linear scale on each axis* *all 5 points plotted accurately* *points joined together with smooth curve*	**2** **2** **1**	1 mark for each axis deduct 1 mark for each mistake 0 marks if points joined with straight lines
(d)	as you increase the carbon dioxide concentration, the increase in mass is greater at higher concentrations the increase is less/the gradient is less steep at higher concentrations increasing carbon dioxide further makes less difference	**2**	any comments which show the candidate has realised that the line is levelling off
(e)	repeats more carbon dioxide concentrations	**1**	any appropriate suggestion
7. (a)	six legs three body parts two pairs of wings	**2**	any two appropriate features
(b)	disease increased predation loss of habitat/food sources pollution	**2**	any two suitable suggestions
(c)	most frequent flower colours previous research showed these to be popular colours students' own research suggested these would be good colours they are the colours of the flowers of broccoli, cauliflower and apple	**1**	any appropriate suggestion

Q.	Answer	Mark	Additional Guidance
(d)	blue attracted the bees the most red did not attract any bees more bees in the garden than in the meadow	**3**	any three suitable comments each comment must compare both areas to gain 1 mark
(e)	increase number of plants with blue/yellow flowers reduce the number of predators of bees increase number of artificial bee hives	**2**	credit any two suitable suggestions
Total		**60**	