ISEB
Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

BIOLOGY

MARK SCHEME

Specimen Paper

(for first examination in Autumn 2017)

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

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Q.	Answer	Mark	Additional Guidance
1. (a)	mitochondria	**8**	
(b)	×500		
(c)	absorb water		
(d)	a zygote		
(e)	photosynthesis		
(f)	scurvy		
(g)	habitat		
(h)	species		
2.	**carbohydrates** and **lipids** are sources of energy	**1**	both for 1 mark accept butter, fats, oil, sugar
	oil is a lipid which is a liquid at room temperature	**1**	
	protein is needed for growth and repair of tissues	**1**	
	oranges are a good source of **vitamin C**	**1**	
	fats are good for insulation	**1**	accept lipids or oils
	fibre prevents constipation	**1**	
3. (a)	*anther:* produces pollen	**1**	
	stigma: receives pollen	**1**	
	ovule: contains the female gamete	**1**	accept 'develops into the seed'
(b)	wind-pollinated flowers do not have bright petals, whereas insect-pollinated flowers do	**1**	accept any two correct differences
	anthers hang out of the flower in a wind-pollinated flower, whereas they are contained within the flower of the insect-pollinated flower	**1**	the answer must be a valid comparison
	stigmas are 'feathery' in wind-pollinated flowers, whereas they are not 'feathery' in insect-pollinated flowers		

Q.	Answer	Mark	Additional Guidance
(c)	wind pollination disperses pollen produced by anthers seeds are produced after fertilisation and are dispersed by fruits pollen contains male gametes seeds contain plant embryos	**2**	any two appropriate differences, explained fully
4. (a) (i)	average for area **A** = 17.4	**1**	
	average for area **B** = 35	**1**	
(ii)	the results for day 2 are the lowest in the dataset for both area **A** and area **B**	**1**	
	perhaps cold weather slowed down the activity of the animals in both areas	**1**	any plausible answer that applies to both areas
(b) (i)	the plants shedding leaves into the soil at area **B** could provide food for herbivorous soil animals and bacteria these could form food for soil carnivores	**3**	link the presence of the trees to food availability an answer which suggests the establishment of food chains
(ii)	the amount of plant material in the soil in area **B** needs to be compared with the soil in area **A**	**1**	1 mark for an appropriate suggestion 1 mark for showing how it tests the hypothesis
	the range of herbivorous soil animals in area **A** could be compared with area **B**	**1**	candidates could give a variety of answers to this question and credit should be given for sensible thoughts
(c)	*Chilopoda*	**1**	centipedes belong to the class of *Chilopoda*

Q.	Answer	Mark	Additional Guidance
5. (a)	mammals have fur produce milk	**2**	any two appropriate suggestions, applying to badgers and to mammals
(b) (i)	% invertebrates = 48%	**1**	
(ii)	% plant items = 36%	**1**	
(c) (i)	badgers eat plant and animal items and are omnivores they eat a large variety of food items, suggesting they eat whatever they can find and so are opportunistic	**1** **1**	answer should explain why badgers are opportunistic and omnivores
(ii)	to locate earthworms beneath the soil and to be able to extract them requires considerable specialised adaptations; earthworms form the largest component in the badgers' diet	**2**	answer should discuss earthworms and awareness of 'specialised' skills
(iii)	earthworms form the largest single component of the badgers diet they eat earthworms whenever they can yet, the % of plant material (48%) is greater than the % for earthworms (30%)	**3**	it does not matter which claim is thought to be stronger; some might say that both are right; credit is given for the quality of the supporting argument up to 2 marks for appropriate evidence; 1 mark for an acceptable standard of spelling, punctuation and grammar
6. (a)	the trachea links the lungs to the outside of the body the trachea branches and extends to the nose and the mouth, suggesting both are involved in breathing	**1** **1**	
(b)	breathing brings inhaled air to the lungs and expels exhaled air from the body	**2**	accept correct answers involving oxygen and carbon dioxide
(c) (i)	20×	**1**	credit correct answer if no working
(ii)	because the bodies of mice and frogs are different in size and this standardises the results	**2**	accept alternative answers

Q.	Answer	Mark	Additional Guidance
(d) (i)	the lungs of frogs have less surface area than those of mice and are less efficient being able to breathe across the skin makes the gaseous exchange more efficient this helps the frogs to survive	**3**	
(ii)	the skin of the amphibians needs to be kept moist to allow them to breathe amphibians reproduce in water	**2**	accept answers that refer to 'frogs'
7. (a) (i)	respiration in the absence of oxygen	**1**	
(ii)	carbon dioxide	**1**	
(b) (i)	to prevent the contamination of the beer by harmful micro-organisms coming from the air	**2**	
(ii)	the yeast will not respire anaerobically and produce alcohol in the presence of air	**2**	accept 'because aerobic microbes turn alcohol to vinegar'
Total		**60**	