

Science Paper 9C 2012

/ means OR eg. green / blue – answer needs green OR blue

() means additional, not really required eg. Gauze (mat) – gauze would be sufficient

: means AND eg. red : hot - answer needs red and hot.

Question	Evidence	Marks			
One (a)(i)	gravitational	All three = 1 mark			
(ii)	elastic				
(iii)	kinetic				
(b)(i)	ball loses height / doesn't bounce as high (as before)	1 mark			
(ii)	lost as sound / heat / transferred to grass or soil	1 mark			
Two (a)		Solid	Liquid	Gas	1 mark
	Takes vol & shape of container			✓	
	Definite shape	✓			
	Can be compressed			✓	
(b)(i)	Room temperature (25°C) is between the melting point and boiling point for substance C / room temperature higher than melting point but below boiling point for substance C	1 mark			
(ii)	D	½ mark			
(c)(i)	Diffusion	½ mark			
(ii)	<ul style="list-style-type: none"> • Candle heats lavender oil • Oil particles move more rapidly/ have more energy • Lavender oil particles more likely to break free from each other/ evaporate quicker/ break their weak bonds 	Any two = 1 mark. All three = 2 marks			
(d)	A,D,C,B	1 mark			
Three (a)	Star = luminous : moon = non-luminous : white paper = non-luminous	½ mark			
(b)	Normal drawn as dotted line 90° from mirror surface AND angle of reflection = 50°	1 mark			
(c)(i)	Slight refraction on entry AND exit of lens	1 mark			
	Rays focused on retina with no gaps in the rays	1 mark			

(ii)	Optic nerve	½ mark
Four (a)	<p>Correct food chains/ web</p> <pre> graph BT seaweed --> winkle winkle --> star_fish star_fish --> sea_otter sea_urchin --> sea_otter sea_urchin --> crab winkle --> crab scallop --> crab crab --> octopus </pre> <p>The diagram shows a food web with the following organisms in boxes: seaweed, sea urchin, winkle, star fish, sea otter, crab, scallop, and octopus. Energy flow is indicated by arrows. Solid arrows (correct): seaweed to winkle, winkle to star fish, star fish to sea otter, sea urchin to sea otter, sea urchin to crab, winkle to crab, and scallop to crab. Dashed arrows (incorrect): sea urchin to sea otter, sea urchin to crab, and crab to sea otter.</p>	<p>One food chain correct Must use arrows =1 mark.</p> <p>All food web correct = 2 marks</p>
(b)	<p>It increases. Fewer sand eels are eaten by other predators</p>	<p>1 mark 1 mark</p>
Five (a)	High flexibility/ has the flexibility to wrap around food.	½ mark
(b)	Low melting point of 80 °C SO may melt on hot food	½ mark
(c)	<p>One of: Same size/ width/ length of strip. (NOT same amount) Use the same increments of weights/ same sizes of weights Start at 0 g and work upwards NOT 'same person to measure...' as it is clearly Liz</p>	1 mark
(d)	<p>Plastic B has a much greater flexibility (stretch) than A and so would wrap around food easier. (accept reverse argument) Plastic B is almost as strong as PVC and so should not break too easily. (accept reverse argument) Must relate its properties to its application.</p>	<p>1 mark 1 mark</p>
(e)	Any sensible named replacement (eg metal, wood, ivory, leather) AND use AND at least one reason (eg lighter, cheaper, more durable, more ethical)	<p>Replacement + use + one reason = 1 mark. Replacement + use + two reasons = 2 marks.</p>
SIX (a)	So the dyes do not dissolve in the water/ so the dyes do not mix in the water	1 mark

(b)	C & D because X's chromatogram matches C & D	1 mark
(c)	Is insoluble / does not dissolve in water / does not dissolve in this solvent	1 mark
Seven (a)	As time increases (passes) the ice platform gets shorter	1 mark
(b)	The ice may break under them / be unsteady / it may be too thin to hunt on successfully.	1 mark
(c)	A non-living factor	½ mark
(d)	<ul style="list-style-type: none"> • Human activity creates carbon dioxide. • More CO₂ traps more of the sun's heat around the Earth / prevents more infra-red radiation from escaping into space. • Global temperatures rise. 	2- 3 ideas = 1 mark
	Evidence = graph shows that as time increases (passes) the thickness of the ice has decreased.	1 mark
(e)(i)	5 / shiny roof	½ mark
(ii)	2	1 mark
(iii)	<ul style="list-style-type: none"> • More fertiliser = more plant growth • More plants = more photosynthesis • More photosynthesis = more CO₂ used 	2-3 ideas = 1 mark
Eight (a)	<ul style="list-style-type: none"> • Organism B = 2,5,6,8. Nortis Biapis • Organism C = 9, 12, 13. Rossi Apus • Organism D = 9, 10. Rossi Unicornus 	1 mark per correct answer. Max 3 marks.
(b)	To arrange organisms (things) into groups where they share similarities/ common features/ are related	1 mark
(c)	New (species of) Norrit may be discovered	1 mark
(d)(i)	Must have; unsegmented mora, 2 spiked felts and pointed apus. (anything else is ok)	1 mark
(ii)	<ul style="list-style-type: none"> • Shape of 'shake' • Type/ shape of 'prop' • 'Shake' spots 	Any two = 1 mark
		40 marks