
SCIENCE

1113/02

Paper 2

April 2019

MARK SCHEME

Maximum Mark: 50

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Markers were instructed to award marks. It does not indicate the details of the discussions that took place at an Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the End of Series Report.

Cambridge will not enter into discussions about these mark schemes.

This document consists of **14** printed pages.

Annotations and abbreviations

/ OR alternate responses for the same marking point

() the words or units in brackets do not need to be stated

Accept an acceptable response

Do not accept indicates an incorrect response that would contradict another otherwise correct alternative

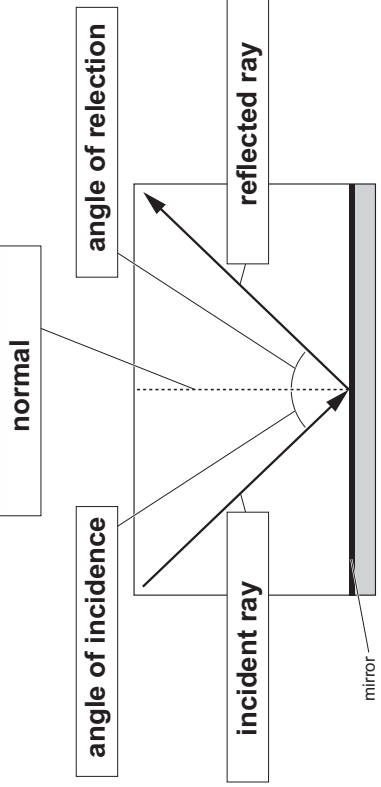
Ignore indicates an irrelevant answer that is not creditworthy, however, full marks can still be achieved even with the answers that are ignored
ecf error carried forward, marks are awarded if an incorrect response has been carried forward from earlier working, provided the subsequent working is correct

ora or reverse argument

note provides extra information when necessary

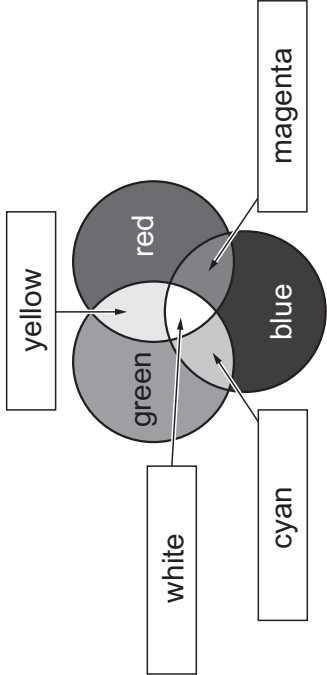
Question	Answer	Marks	Further Information
1(a)	any three from respiration reproduction growth nutrition excretion movement / can move sensitivity / irritability	1	three correct = 1 mark
1(b)(i)	(many) more yeast (cells) / more cells	1	Accept cells multiplied / yeast increases / multiply themselves
1(b)(ii)	cells had divided / reproduced	1	

Question	Answer	Marks	Further Information
2(a)	<p>Forces between the particles are weak. <input checked="" type="checkbox"/></p> <p>The particles are only able to vibrate. <input type="checkbox"/></p> <p>The particles form a fixed shape. <input type="checkbox"/></p> <p>The particles have very little energy. <input type="checkbox"/></p>	1	more than one tick = 0 marks
2(b)	<p>absorption diffusion</p> <p style="text-align: center;">dissolving</p> <p style="text-align: right;">mixing</p>	1	more than one answer circled = 0 marks
2(c)	<p>any two from</p> <p>(idea that) particles will have more energy</p> <p>particles move faster</p> <p>particles collide more</p> <p>particles spread out more</p>	2	<p>note the answer must refer to particles at least once to get maximum marks</p> <p>note assume answer refers to hot food if not specified.</p> <p>Accept ora if specified</p> <p>Accept particles have more kinetic energy = 2 marks</p> <p>Accept spread out faster / particles diffuse faster</p>

Question	Answer	Marks	Further Information
3		3	<p>five correct = 3 marks</p> <p>three or four correct = 2 marks</p> <p>one or two correct = 1 mark</p>

Question	Answer	Marks	Further Information
4(a)	A B C D E	1	more than one answer circled = 0 marks
4(b)	pollen lands on stigma	1	Accept pollen transferred from one flower to another / pollen goes from anther to stigma Accept pollen lands on A Accept 'male gamete' for 'pollen'
4(c)	A B C D E	1	more than one answer circled = 0 marks
4(d)	(nucleus of) pollen and (nucleus of) ovule fuse	1	Accept 'female gamete' or 'egg' for 'ovule' Accept 'male sex cell' for 'pollen' and 'female sex cell' for 'ovule' Accept male gamete for pollen Accept gametes fuse / gametes join together / gametes combine Accept pollen or male gamete and ovule form a zygote

Question	Answer	Marks	Further Information
5(a)	(electronic) balance	1	<p>Accept scale(s) / beam balance / triple beam balance</p> <p>Do not accept weighing balance or weighing scales</p>
5(b)	D	1	
5(c)	<p>Hazard: hot dish / burn hand / the oven is hot.</p> <p>To avoid the hazard Rajiv should use tongs / heat resistant gloves / let the dish cool before picking it up.</p> <p>OR</p> <p>Hazard: getting soil in eyes.</p> <p>To avoid the hazard Rajiv should wear goggles / safety glasses.</p>	2	<p>note hazard = 1 mark how to avoid the hazard = 1 mark</p> <p>note two marks can only be awarded by a hazard and a linked precaution</p> <p>Accept Hazard idea of heat damage to clothes. To avoid the hazard Rajiv should wear lab coat.</p> <p>OR</p> <p>Hazard bacteria from soil / insects in soil / infection from soil / toxic (minerals in) soil. To avoid the hazard Rajiv should wear goggles / safety glasses / gloves.</p>



Question	Answer	Marks	Further Information
6		2	<p>note only accept these colours</p> <p>four correct = 2 marks</p> <p>two or three correct = 1 mark</p> <p>one correct = 0 marks</p>
7	<p>When metals react with acid the products are a salt and hydrogen.</p> <p>When carbonates react with acid the products are a salt, water and carbon dioxide.</p>	3	<p>Further Information</p> <p>each missing substance = 1 mark</p> <p>water and carbon dioxide in either order</p>

Question	Answer	Marks	Further Information
8(a)	to obtain reliable results	1	Accept to work out an average
8(b)	<p>any one from</p> <p>birds are (too) mobile / immigration / migration / fly away</p> <p>(rapid) birth / death</p> <p>out at different times of day</p> <p>impossible to count them all / too many / over too large an area</p> <p>idea of difficult to be sure that you have not counted same bird twice or some not at all</p>	1	Accept cannot find them as they are in different places / not all birds seen

Question	Answer	Marks	Further Information
8(c)	<p>any two from</p> <ul style="list-style-type: none"> habitat (destruction) food (supply) / damage to food chains / amount of prey predation / hunters competition pest control (trapping / shooting / use of poisons) climate (change) disease time of year / season pollution 	2	<p>Accept competition for a named factor e.g. nesting sites or shelter</p> <p>Accept reproduction (rate) / birth rate / death rate</p>
Question	Answer	Marks	Further Information
9(a)	<p>The nucleus of the atom contains protons and neutrons.</p> <p>The nucleus is surrounded by particles called electrons.</p>	3	either order each correct answer = 1 mark
9(b)(i)	H	1	
9(b)(ii)	Na	1	

Question	Answer	Marks	Further Information
10(a)	the transfer of energy	1	Accept energy transfer / energy flow
10(b)	mouse, rabbit and grasshopper	1	all three required
10(c)	the hawk feeds at more than one trophic level/ can be a tertiary consumer	1	Accept it eats (both primary and) secondary consumers
10(d)	hawk	1	
10(e)	any one from go up – more grass to eat/less competition (by rabbits) for food go down – lack of rabbits means hawks will need to eat more mice stay the same – idea that more grass to eat AND more predation by hawks will even out	1	mark the change and the linked reason

Question	Answer	Marks	Further Information
11(a)	<p>any two from</p> <ul style="list-style-type: none"> sun / solar wind / (a)eolic wave geothermal biofuel / biomass tidal 	1	<p>two correct = 1 mark</p> <p>Do not accept nuclear</p> <p>Accept wood</p>
11(b)	<p>any three from</p> <ul style="list-style-type: none"> (%) of coal decrease (%) of oil decrease (%) of natural gas decrease (%) of (other) renewables increase / example of renewable increasing e.g. tidal increases (%) of hydroelectric increase 	3	<p>Accept (%) of fossil fuels or non-renewables will decrease if no marks awarded for coal, oil or natural gas</p> <p>Accept (%) of nuclear (may) increase / (%) of nuclear (may) decrease</p>

Question	Answer	Marks	Further Information
12(a)	<p>The name of this electrical component is a cell.</p> <p>The electrical circuit symbol for this component is</p>  <p>or</p> <p>Name of this electrical component is a battery.</p> <p>The electrical circuit symbol for this component is</p> 	2	<p>correct component = 1 mark</p> <p>correct symbol = 1 mark</p>
12(b)	<p>In circuit A the lamps do not work.</p> <p>This is because there is no current / a gap in the circuit / it is a series circuit / electrons cannot flow / the circuit does not transfer electrical energy.</p> <p>In circuit B the lamps work.</p> <p>This is because there is current to each lamp / current divides / the lamps are still in a complete circuit / it is a parallel circuit / electrons can flow / the circuit still transfers electrical energy.</p>	2	<p>correct two answers for A = 1 mark</p> <p>correct two answers for B = 1 mark</p>

Question	Answer	Marks	Guidance
13(a)	hydrogen	1	
13(b)	calcium carbonate calcium chloride calcium hydrate calcium hydroxide calcium oxide	1	more than one circled = 0 marks
13(c)	(idea that) too reactive / not safe / may burst into flames	1	
Question	Answer	Marks	Guidance
14	pencil has large(r) area so less pressure / so low pressure	2	note assume answers refer to pencil Accept ora if pin specified Accept pressure is force / area as an equation or in words = 2 marks