

Mark Scheme for January 2012

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.










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Annotations

Annotation	Meaning
	correct response
	incorrect response
	benefit of the doubt
	benefit of the doubt not given
	error carried forward
	information omitted
	ignore
	reject
	contradiction

Subject-specific Marking Instructions

- / = alternative and acceptable answers for the same marking point
- (1) = separates marking points
- allow = answers that can be accepted
- not = answers which are not worthy of credit
- reject = answers which are not worthy of credit
- ignore = statements which are irrelevant
- () = words which are not essential to gain credit
- = underlined words must be present in answer to score a mark (although not correctly spelt unless otherwise stated)
- ecf = error carried forward
- AW = alternative wording
- ora = or reverse argument

Question		Answer	Marks	Guidance
1	(a)	damaged fruit (1) potato peelings (1)	2	more than 2 answers, deduct one mark for each incorrect answer allow underlining
	(b)	bacteria / fungi (1)	1	allow mould not germs / microbes
	(c)	aerates / lets oxygen or air in (1)	1	allow idea that spreads out microbes allow idea of oxygen available e.g. (microorganisms) use oxygen ignore compost reacts with oxygen
	(d)	photosynthesis (1)	1	allow growth
Total			5	

Question		Answer	Marks	Guidance
2	(a)	enters through roots / root hairs (1) moves up stem / trunk (1) exits through the leaves (1) by evaporation / transpiration (1)	4	allow moves along branches (to leaves) (1) allow higher level answers as additional marking points: enters by osmosis (1) moves through xylem (1) ignore phloem exits through stomata (1) by diffusion (1)
	(b)	leaves / (leaf) pores / stomata (1) roots / root hairs (1) roots / root hairs (1)	3	not stem / trunk
Total			7	

Question			Answer	Marks	Guidance
3	(a)	(i)	900(J) (1)	1	ignore 90% allow 0.9kJ
		(ii)	2(J) (2) BUT working clearly indicating taking a percentage of each stage (1)	2	
		(iii)	(lost through) heat / respiration / movement (1) egestion / faeces / excretion / not all food digested / not all food eaten (1)	2	mark as one paragraph allow energy transferred to other members of food web / organisms not shown in diagram / AW ignore waste allow excrete waste / named waste (1) for growth means a maximum of one mark can be scored
	(b)	(i)	insecticide (1)	1	more than one answer = 0 allow underlining
		(ii)	introduce a predator / biological control / AW (1)	1	allow valid example of a predator allow introduce disease / parasite
	(c)		(growing plants) without soil / in nutrient solution / in fertiliser solution (1)	1	allow valid description eg in gel / in beads ignore just water / liquid / fluid
Total				8	

Question		Answer	Marks	Guidance
4	(a)	<p>penis <input type="checkbox"/></p> <p>ovary <input checked="" type="checkbox"/></p> <p>oviduct <input type="checkbox"/></p> <p>sperm duct <input type="checkbox"/></p> <p>testis <input checked="" type="checkbox"/></p>	2	each incorrect tick loses 1 mark down to zero
	(b)	(i) fertilisation (1)	1	
		(ii) pulse (rate) (1)	1	ignore. how many beats per minute
		(iii) respiratory system / breathing system (1)	1	allow lungs allow digestive system ignore reference to reproductive systems
		(iv) Rhesus (1)	1	allow phonetic spelling allow + or –
		Total	6	

Question			Answer	Marks	Guidance
5	(a)		carbon dioxide (1)	1	allow CO ₂
	(b)	(i)	maximum / largest volume of air taken in and breathed out in one breath (1)	1	allow largest amount of air exchanged in a single breath allow volume of air exchanged in a deep breath allow maximum / largest volume of air taken in during one breath allow maximum / largest volume of air breathed out in one breath allow total capacity minus residual volume
		(ii)	1.6(litres) (1)	1	allow answer in range 1.5 – 1.7
		(iii)	48% (2) But 2.4 / 5.0 (1)	2	
	(c)		a donor (dead or living) (1)	1	allow idea of organ bank allow someone with a matching/similar tissue type ignore dead people / another person unless qualified
	(d)		mitosis (1)	1	allow phonetic spelling but must be clear it is a “t” in the middle
			Total	7	

Question		Answer	Marks	Guidance
6	(a)	ball (and socket) (1) movements in more than one plane / in most directions (1)	2	allow universal joint (1) allow movement in three axes (1) allow rotation / in all directions / (all) around / swivel / 360° ignore wide range of movement / flexible
	(b)		2	all correct 2 marks one correct 1 mark
	(c)	blood clots (at the area of skin that bone cut) (1) clots form in the blood vessels / clots (in blood vessels) stop blood flow (1) anti-coagulant drugs used to reduce clotting (1)	3	allow coagulation of blood for blood clots (1) allow higher level responses platelets and clotting process e.g. platelets cause blood to clot (at the area of skin that bone cut) (2) allow thrombosis(1) allow named examples like warfarin/heparin/aspirin(1)
Total			7	

Question		Answer	Marks	Guidance
7	(a)	apple (1)	1	
	(b)	athlete's foot (1)	1	allow answer ringed, circled or underlined if answer line is blank.
	(c)	fermentation (1)	1	allow anaerobic respiration ignore just respiration / brewing
	(d)	stop yeast growing or reproducing (1)	1	allow to stop fermentation allow prevents growth of other microbes e.g. stops bacteria growing
	(e)	gasohol (1)	1	
Total			5	

Question		Answer	Marks	Guidance
8	(a)	alginate (1)	1	allow answer ringed, circled or underlined if answer line is blank.
	(b)	(i) 57(2) if answer incorrect 95 – 38 (1)	2	allow 2 1/2 times faster (2) allow answer in range 56-58(2)
		(ii) any two from: increases optimum temperature / works best at 50°C instead of 40°C (1) more active at higher temperatures / more active at quoted temperature (43.5°C - 60°C) (1) less variation in activity / activity is less affected by temperature (1) between 36 – 43.5°C activity is lower (1)	2	assume answer refers to immobilised enzymes unless stated allow higher level answers eg denatures at a higher temperature (1) allow tested / works over a narrower range of temperatures (1) ignore reference to 25 - 35°C
Total			5	

Question		Answer	Marks	Guidance
9	(a)	any two from: gene / DNA taken from onion (1) gene / DNA put into banana (1) gene starts to work in banana (1)	2	not breed onions with banana allow higher level answers, eg correct reference to restriction enzymes(1) ligase(1)
	(b)	any two from: anchorage / support (1) (to get) nutrients /minerals (1) (to get) water (1)	2	allow stability(1) allow named minerals or elements eg phosphates (1) nitrates (1) nitrogen (1)
	(c)	(i) springtail (1)	1	
		(ii) any two from: aerate (soil) (1) improve drainage (1) mix up (soil layers) (1) neutralise (acid) soils (1) break down organic matter / leaves (1)	2	mark as one paragraph allow increase oxygen /air (in soil) / provide air channels (1) allow introduce water channels (1) allow mix up minerals (1) allow increase pH of soil (1) not decrease pH of soil ignore releases minerals decomposing negates this marking point only
	(d)	(i) digester (1)	1	allow septic tank / fermenter
		(ii) methane (1)	1	allow CH ₄
		(iii) no mains electricity (1)	1	allow provides them with free electricity allow idea that biogas or material used to make biogas is renewable ignore reference to fossil fuels
Total			10	

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