

Name: MARKSCHEME

## Year 3 – GCSE Practice Questions

Here is a range of questions to practise before your summer exam. They include:

- Graph interpretation questions
- Command terms: suggest, describe, explain
- Longer answer questions
- Calculation questions
- Investigation and data analysis questions
- Questions where you need to apply your knowledge to a new context

Markscheme can be found on:

**[jemasters.wikispaces.com](http://jemasters.wikispaces.com)** on the “Recent Material” link and there is also a copy on the board in S4

It’s really important to check your answers match the key words in the mark scheme. If in doubt, ask me!

**Question 9**

question	Answers	extra information	mark
9(a)		if more than one box is ticked award no mark	1
9(b)	<p>increasing / higher light / temperature</p> <p>more / increased photosynthesis</p>	<p>ignore references to months other than February – April</p> <p>do <b>not</b> accept mineral / ions increase</p> <p>for both marks there must be a reference to 'more' at least once (e.g. 'more light for photosynthesis' gains <b>2</b> marks)</p> <p>allow <b>1</b> mark for reference to light <b>and</b> photosynthesis without an idea of 'more'</p>	1 1
9(c)	<p>increase due to increase in plant plankton / food</p> <p>decrease due to fall in plant plankton / food or decrease as eaten by (basking) sharks</p>	<p>ignore references to months other than April – July</p> <p>allow decrease as eaten by predators / animals / fish</p>	1 1
9(d)	<p>fall due to use / intake by <u>plant</u> (plankton)</p> <p>increase due to decay / decomposition / breakdown</p> <p>of dead (plant / animal) plankton</p>	<p>ignore ref to no change section of graph</p> <p>for fall allow March / April ignore May / February</p> <p>for increase allow any month in range August to November ignore December</p> <p>allow of dead organisms / waste</p>	1 1 1
<b>Total</b>			<b>8</b>

**UMS Conversion Calculator:** [www.aqa.org.uk/umsconversion](http://www.aqa.org.uk/umsconversion)

**Question 7**

question	answers	extra information	mark
<b>7(a)</b>	A cytoplasm	in this order only	1
	B (cell) membrane	do <b>not</b> accept (cell) wall	1
<b>7(b)(i)</b>	synapse		1
<b>7(b)(ii)</b>	(as) chemical	accept neurotransmitter or named ignore references to how the chemical is passed do <b>not</b> accept electrical	1
<b>7(c)</b>	(from light-sensitive cell to connecting neurone) to sensory neurone	ignore references to synapses accept 'nerve cell' for neuron(e) throughout penalise 'nerve' for neurone once only	1
	(sensory neurone) to brain / CNS	allow (sensory neurone) to relay neurone / spinal cord	1
	(brain / CNS) to motor neurone	allow (relay neurone / spinal cord) to motor neurone	1
	(motor neurone) to (eyelid) muscle	ignore effector	1
<b>Total</b>			<b>8</b>

Question	Answers	Extra information	Mark	AO / spec ref.
5(a)	motor	allow efferent / postsynaptic allow <b>another</b> relay (neurone)	1	AO1 1.2.1d, e
5(b)	release of chemical (from relay neurone)	allow ecf for 'motor' neurone from (a) allow release of neurotransmitter / named example	1	AO1 / AO2 1.2.1e
	chemical crosses gap / junction / synapse	allow diffuses across allow chemical moves to X	1	
	chemical attaches to X / motor / next neurone (causing impulse)		1	
5(c)	(curare) decrease / no contraction	accept (muscle) relaxes	1	AO2 / AO3 1.2.1e
	(strychnine) increase / more contraction	if no other mark awarded allow 1 mark for (curare) decrease / no response <b>and</b> (strychnine) increase / more response	1	
<b>Total</b>			<b>6</b>	

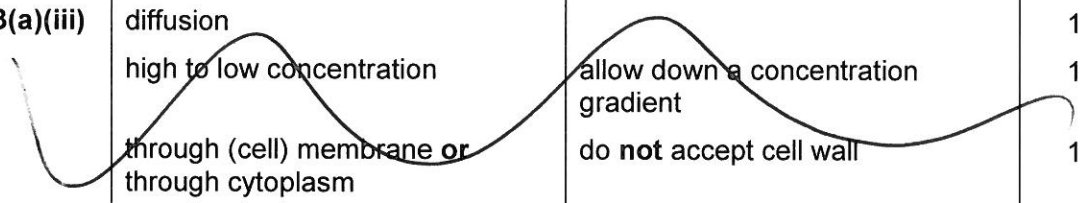
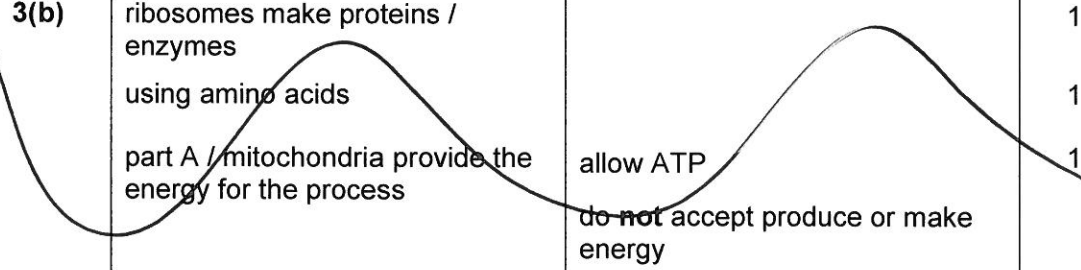
Question	Answers	Extra information	Mark	AO / spec ref.
2	Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5 and apply a 'best-fit' approach to the marking.		6	AO1 1.4.1d,f
<b>0 marks</b>	<b>Level 1 (1-2 marks)</b>	<b>Level 2 (3-4 marks)</b>	<b>Level 3 (5-6 marks)</b>	
No relevant content.	At least <b>one</b> way in which animals <b>and</b> / <b>or</b> plants are adapted to survive.	A description of ways in which animals <b>and</b> / <b>or</b> plants are adapted <b>and</b> an attempt to link at least <b>one</b> adaptation to how it increases the chance of survival.	A description of ways in which animals <b>and</b> plants are adapted <b>and</b> a description of how at least <b>one</b> adaptation increases the chance of survival.	
<b>examples of biology points made in the response:</b> (animals) <ul style="list-style-type: none"> <li>• (A) change / decrease in surface area / example                             <ul style="list-style-type: none"> <li>○ (decrease in surface area which) reduces area from which sweat / water may be lost</li> </ul> </li> <li>• (A) hump with fat / fat stores                             <ul style="list-style-type: none"> <li>○ (fat in hump) to convert to water (via respiration)</li> </ul> </li> <li>• (A) long eyelashes                             <ul style="list-style-type: none"> <li>○ (long eyelashes) to keep (wind-blown) dust out of eyes</li> </ul> </li> <li>• (A) nocturnal / 'keep out of the sun'                             <ul style="list-style-type: none"> <li>○ reduce sweat loss (in heat of the day)</li> </ul> </li> </ul> (plants) <ul style="list-style-type: none"> <li>• (A) decrease in surface area</li> <li>• (A) leaves are spikes                             <ul style="list-style-type: none"> <li>○ (reduced area / leaves are spikes) reduces water loss / transpiration / evaporation</li> </ul> </li> <li>• (A) long / wide spread / extensive roots                             <ul style="list-style-type: none"> <li>○ (long / wide spread /extensive roots) to absorb (more) water</li> </ul> </li> <li>• (A) fleshy / thick stem                             <ul style="list-style-type: none"> <li>○ (fleshy / thick stem) to store water</li> </ul> </li> </ul>		<b>extra information</b> allow adaptations of specific animals to living in specified dry conditions, eg a desert <ul style="list-style-type: none"> <li>• (A) change / increase in surface area / example                             <ul style="list-style-type: none"> <li>○ (increase in surface area which) increases area heat may be lost from (by radiation)</li> </ul> </li> <li>• (A) changes to thickness of insulating coat                             <ul style="list-style-type: none"> <li>○ (thicker coat on upper surface) increases insulation from sun's heat</li> </ul> </li> <li>• (A) thin (layer) / reduced amount of body fat                             <ul style="list-style-type: none"> <li>○ (reduced amount of body fat which) reduces insulating layer</li> </ul> </li> <li>• (A) wide feet                             <ul style="list-style-type: none"> <li>○ (wide feet) to reduce pressure / spread weight / prevent sinking</li> </ul> </li> </ul> allow adaptations of specific plants to living in specified dry conditions, eg a desert <ul style="list-style-type: none"> <li>• (A) thick wax                             <ul style="list-style-type: none"> <li>○ (thick wax) to reduce evaporation / water loss / transpiration</li> </ul> </li> <li>• (A) few(er) stomata                             <ul style="list-style-type: none"> <li>○ (few stomata) to reduce evaporation / water loss / transpiration</li> </ul> </li> </ul>		
<b>Total</b>			<b>6</b>	

Question	Answers	Extra information	Mark	AO / spec ref.
<b>1(a)</b>	3-layered triangular pyramid	as blocks or layered triangle, ignore (small) gaps between layers	1	AO2 1.5.1b
	(pyramid) labelled in food chain order	all three labels are required for <b>2</b> marks the pyramid must be fully correct	1	
<b>1(b)(i)</b>	C		1	AO3 1.5.1c
<b>1(b)(ii)</b>	shortest or fewest stages / transfers / (trophic) levels	allow only if (b)(i) is C or blank	1	AO1 / AO2 1.5.1c
	less losses in waste / faeces / urine / CO <sub>2</sub> / excretion	allow smaller amount uneaten	1	
	less loss in respiration / heat / movement	allow less lost keeping warm  do <b>not</b> allow energy for respiration do <b>not</b> allow respiration makes energy  allow less loss (of biomass / energy) or less transfer (of biomass / energy) to surroundings if neither 2 <sup>nd</sup> nor 3 <sup>rd</sup> point given, for <b>1</b> mark	1	
<b>Total</b>			<b>6</b>	

Question	Answers	Extra information	Mark	AO / spec ref.
3(a)	<u>anaerobic respiration</u>	allow phonetic spelling	1	AO1 2.6.2a, b,d
3(b)(i)	4.4	4.2, 4.3, 4.5 or 4.6 with figures in tolerance (6.7 to 6.9 and 2.3 to 2.5) and correct working gains 2 marks  4.2, 4.3, 4.5 or 4.6 with no working shown or correct working with one reading out of tolerance gains 1 mark  correct readings from graph in the ranges of 6.7 to 6.9 <b>and</b> 2.3 to 2.5 but no answer / wrong answer gains 1 mark	2	AO2 2.6.2a, b,d
3(b)(ii)	more energy is needed / used / released (at 14 km per hour)  not enough oxygen (can be taken in / can be supplied to muscles)  so more <u>anaerobic</u> respiration (to supply the extra energy) <b>or</b> more glucose changed to lactic acid	do <b>not</b> allow energy production ignore work  allow reference to oxygen debt do <b>not</b> allow less / no oxygen  allow not enough aerobic respiration	1  1  1	AO1 / AO2 2.6.2a, b,d
<b>Total</b>			<b>6</b>	

**BL2HP**

**Question 3**

question	answers	extra information	mark
3(a)(i)	mitochondrion / mitochondria	must be phonetically correct	1
3(a)(ii)	carbon dioxide / CO <sub>2</sub> water / H <sub>2</sub> O	in either order accept CO2 but <b>not</b> CO <sup>2</sup> accept H2O <b>or</b> HOH but not H <sup>2</sup> O	1 1
3(a)(iii)	diffusion high to low concentration through (cell) membrane <b>or</b> through cytoplasm	 allow down a concentration gradient do <b>not</b> accept cell wall	1 1 1
3(b)	ribosomes make proteins / enzymes using amino acids part A / mitochondria provide the energy for the process	 allow ATP do <b>not</b> accept produce or make energy	1 1 1
<b>Total</b>			<b>9</b>



**BL2HP**

**Question 1**

question	Answers	extra information	mark
1(a)	any one from: <ul style="list-style-type: none"> <li>• add a water bath</li> <li>• heat screen</li> <li>• use LED</li> <li>• low energy bulb / described</li> </ul>	ignore 'check temperature'	1
1(b)(i)	rate / number of bubbles decreases or less oxygen / gas released	accept converse with reference to increasing light or shorter distance  ignore reference to rate of photosynthesis	1
1(b)(ii)	temperature / CO <sub>2</sub> (concentration)	accept 'it was too cool' or not enough CO <sub>2</sub> accept number of chloroplasts / amount of chlorophyll allow heat allow CO <sub>2</sub> do not allow CO <sup>2</sup>	1

**Question 1 continues on the next page . . .**

**BL2HP**

**Question 1 continued . . .**

question	Answers	extra information	mark	
1(c)	Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5, and apply a 'best-fit' approach to the marking.		6	
	<b>0 marks</b>	<b>Level 1 (1-2 marks)</b>	<b>Level 2 (3-4 marks)</b>	<b>Level 3 (5-6 marks)</b>
	No relevant content.	There is a brief description of at least 1 tissue <b>or</b> at least 1 function of an indicated part of the leaf.  The account lacks clarity or detail.	There is a clear description which includes at least 1 named tissue and at least 1 correct function described for an indicated part of the leaf.	There is a detailed description of most of the structures and their functions.
	<p><b>examples of responses:</b></p> <ul style="list-style-type: none"> <li>• epidermis</li> <li>• cover the plant</li> <li>• mesophyll / palisade</li> <li>• photosynthesises</li> <li>• phloem</li> <li>• xylem</li> <li>• transport.</li> </ul> <p><b>The following points are all acceptable but beyond the scope of the specification:</b></p> <ul style="list-style-type: none"> <li>• (waxy) cuticle – reduce water loss</li> <li>• epidermis – no chloroplasts so allows light to penetrate</li> <li>• stomata / guard cells – allow CO<sub>2</sub> in (and O<sub>2</sub> out) <b>or</b> controls water loss</li> <li>• palisade (mesophyll) – <u>many</u> chloroplasts to trap light – near top of leaf for receiving more light</li> <li>• spongy (mesophyll) – air spaces for rapid movement of gases</li> </ul>			
<b>Total</b>				<b>9</b>

**Question 3**

question	Answers	extra information	mark
<b>3(a)(i)</b>	wheat → humans chain transfers 10 times more energy than wheat → pigs → humans chain or wheat → pigs → humans chain transfers 810 000 (kJ per hectare) less	allow 10% if given as a comparison e.g. one is 10% of the other  ignore less unqualified	1
<b>3(a)(ii)</b>	any <b>one</b> reason for energy loss from pigs e.g.: <ul style="list-style-type: none"> <li>• movement</li> <li>• (maintaining) body temperature</li> <li>• waste materials</li> <li>• not all parts of pig eaten by human</li> <li>• because there is an <u>extra stage</u> (pigs) in the food chain and <u>energy is lost</u> at each stage</li> </ul>	ignore respiration, growth ignore heat unqualified  allow named examples  allow longer food chain so more energy lost	1

**Question 3 continues on the next page . . .**

**Question 3 continued**

<b>3(b)</b>	Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information on page 5, and apply a 'best-fit' approach to the marking.			<b>6</b>
<b>0 marks</b>	<b>Level 1 (1-2 marks)</b>	<b>Level 2 (3-4 marks)</b>	<b>Level 3 (5-6 marks)</b>	
No relevant content.	There is a basic description of at least one factory farming method <b>or</b> identification of an advantage or disadvantage of factory farming.	There is a description of at least one factory farming method <b>and</b> an advantage or disadvantage is <u>explained</u> .	There is a description of factory farming methods <b>and</b> advantage(s) and disadvantage(s) are explained.	
<p><b>examples of biology points made in the response:</b></p> <p>factory farming methods e.g.:</p> <ul style="list-style-type: none"> <li>• Kept in cramped conditions / battery hens / calf crates / pig barns / fish tanks</li> <li>• Controlled temperature / heating</li> <li>• Controlled feeding / modified food given / growth hormones</li> <li>• Controlled lighting</li> <li>• Treated with <u>prophylactic</u> antibiotics</li> </ul> <p>Advantages e.g.:</p> <ul style="list-style-type: none"> <li>• Increased efficiency / profit / greater food production / cheaper food / faster growth</li> <li>• Farmer can have more livestock</li> <li>• Less energy is lost through movement</li> <li>• Less energy is used keeping warm</li> <li>• (Food is high in calories / protein) so animals will grow faster / lay more eggs</li> <li>• Easier to vaccinate all the animals</li> <li>• Easier to protect animals from predators</li> <li>• Antibiotic treatment stops infections in animals</li> </ul> <p>Disadvantages e.g.:</p> <ul style="list-style-type: none"> <li>• Stress / cruelty / inhumane / unethical</li> <li>• Restricted movement / overcrowding</li> <li>• Faster spread of diseases</li> <li>• Antibiotics in the food chain / residual chemicals in the food chain</li> <li>• Wasting fossil fuels / increasing global warming</li> <li>• Increased pollution from animal waste and from additional transport</li> </ul>				
<b>Total</b>				<b>8</b>

**Question 1**

question	Answers	extra information	mark
<b>1(a)</b>	A aorta	ignore left and right	1
	B ventricle		1
	C atrium	allow atria	1
	D vena cava		1
<b>1(b)(i)</b>	(coronary) artery	allow arteriole	1
<b>1(b)(ii)</b>	stent / description	accept (coronary) by-pass operation allow statins allow diets low in cholesterol allow balloon (angioplasty)	1
<b>1(b)(iii)</b>	(stent) keeps artery open <b>or</b> (by-pass) new blood vessel / vein connecting around narrowed region; <b>or</b> (statins / low cholesterol diet) remove some of the cholesterol blockage <b>or</b> (balloon) widens / opens the blood vessel	must relate to (b)(ii) ignore reference to capillary / vein	1
	which allows (more) blood through or allows blood to go around the blockage		1

**Question 1 continues on the next page . . .**

Question	Answers	Extra information	Mark	AO / spec ref.
4(a)(i)	defence against <b>or</b> destroy pathogens / bacteria / viruses / microorganisms	do <b>not</b> allow 'destroy disease' accept engulf pathogen / bacteria / viruses / microorganism  accept phagocytosis  accept produce antibodies / antitoxins  allow immune response	1	AO1 3.2.2d
4(a)(ii)	they are small fragments of cells		1	AO1 3.2.2e
4(b)	liver  kidney(s)	in this order only	1  1	AO1 3.2.2b
4(c)	any <b>two</b> from: <ul style="list-style-type: none"> <li>that it doesn't cause an immune response <b>or</b> isn't rejected / damaged by white blood cells</li> <li>whether it is a long lasting material / doesn't decompose / corrode / inert</li> <li>if it is strong (to withstand pressure)</li> <li>it will open at the right pressure</li> <li>that it doesn't cause clotting</li> <li>that it doesn't leak <b>or</b> it prevents backflow</li> <li>non toxic</li> </ul>	ignore correct size	2	AO3 3.2
<b>Total</b>			6	