

OXFORD

INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL A-LEVEL BIOLOGY

(9610)

PAPER 2
Mark Scheme

Specimen 2018

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Q	Part	Marking guidance	Total marks
01	1	may damage organ concerned; may cause blockages/obstructions; may damage/exert pressure on other organs;	2 max
01	2	benign does not cause cancer / does not invade other tissues causing damage / with benign tumour, pieces which break off do not start new tumours elsewhere in body/metastasis	1
01	3	Mutagen increases frequency of mutations; Mutation could occur in proto-oncogene / tumour suppressor gene; Results in higher rate of cell division;	2 max
01	4	because cancer has genetic component / may have inherited (onco)gene / gene which gives predisposition to/causes cancer / mutated tumour suppressor gene;	1

Q	Part	Marking guidance	Total marks
02	01	Cholesterol/ lipoprotein/ fatty material/cells; In the artery wall/under lining/endothelium of artery/blood vessel;	2
02	2	(Trapped in) coronary artery/artery supplying heart muscle/ tissue/cells; Prevents oxygen; Reaching (heart muscle/tissue); (Heart muscle) dies/stops respiring;	1
02	3	Allows comparison; Different number of people in each country;	2
02	4	Two marks for correct answer: 47600 One mark for incorrect answer in which number of deaths correctly determined as 170	2

Q	Part	Marking guidance	Total marks
03	01	Lack of ATP; Pump = active transport / requires energy / ATP provides energy / transport is against concentration gradient	2
03	2	Concentration of Na ⁺ inside cell no longer less than concentration in gut lumen /no longer a concentration gradient; No (facilitated) diffusion of NA ⁺ ions possible / amino acid absorption requires diffusion of Na ⁺ ions into cell;	2
03	3	Diffusion / facilitated diffusion;	1

Q	Part	Marking guidance	Total marks
04	1	0.4s	1
04	2	$\left\{ \frac{60}{0.8} \right\} = 75;$	2
04	3	right ventricle; same pattern / description (as left ventricle) but lower (pressure);	2
04	4	High pressure / smoothes out blood flow / artery wall contains more collagen / muscle / elastic (fibres) / connective tissue; Accept converse for pulmonary vein Incorrect function of artery disqualifies mark	1
04	5	1. (Aorta wall) stretches; 1. Allow expand 2. Because ventricle / heart contracts / systole / pressure increases; 2. Reject if MP1 wrong 3. (Aorta wall) recoils; 3. Allow spring back 4. Because ventricle relaxes / heart relaxes / diastole / pressure falls; Reject any reference to contract / relax in MP1 and 3 5. Maintain smooth flow / pressure; 4. Reject if MP3 wrong	3 max

Q	Part	Marking guidance	Total marks
05	1	<ol style="list-style-type: none"> 1. Toxin (produced by bacterium) causes (chloride) ions to move into (lumen of) intestine; 2. Water potential (of intestine contents) falls / water moves by osmosis into intestine / out of cells; 	2
05	2	<ol style="list-style-type: none"> 1. Both show little / no increase / remain constant in January / February; 2. (Up to May) sea temperature rises more quickly / before increase in cholera; 3. Both reach a peak in / decline after April / May; Accept May to June 	2 max
05	3	<ol style="list-style-type: none"> 1. Positive correlation from January to September / October (between sea temperature and cholera cases); 1. Ignore as sea temperature rises, cholera cases rise, as in stem 1. Accept any two months within range 2. Correlation doesn't mean causation, there might be other/named factors involved 3. Only records people in hospital with cholera / may be people with cholera not in hospital; 4. Negative correlation / cases rising as sea temperature falls in October / November; 3. 'At end of year' insufficient 	2 max
05	4	<p>Suitable suggestion with explanation;</p> <ol style="list-style-type: none"> 1. Have produced memory cells; 1. 'Have become immune' is not enough 2. After previous infection/vaccination; 2. Accept 'produces secondary response' <p>OR</p>	2

	<p>3. Different forms of cholera;</p> <p>3. Accept types / strains / variety</p> <p>4. Some don't produce much / any toxins;</p> <p>OR</p> <p>5. Few bacteria ingested;</p> <p>6. Not enough toxin to produce symptoms;</p> <p>OR</p> <p>7. Some people naturally resistant to bacterium;</p> <p>8. Because of structure of cell membranes / amount of secretions eg bile / pancreatic juices;</p>	
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Q	Part	Marking guidance	Total marks
06	1	P = glycoprotein; Q = protein capsid;	2
06	2	Reverse transcriptase makes cDNA/complementary DNA from the (viral) RNA (template); Reverse transcriptase makes a second strand of DNA using cDNA as template; Integrase inserts (new/viral) DNA into host DNA / chromosomes; Protease cuts/cleaves the polypeptide/polyprotein to form several functional proteins (required to produce new viruses)	3 max
06	3	HIV destroys T cells; More (free) viruses produced leads to fall in T-cells; (So fewer) T-cells activate B-cells/memory cells; Reduced/no antibody production; Immune system not working properly/inability to fight infection; Opportunistic infections;	4 max

Q	Part	Marking guidance	Total marks
07	1	Open / use tap / add water from reservoir;	1
07	2	1. Seal joints / ensure airtight / ensure watertight; Answer must refer to precautions when setting up the apparatus Ignore: references to keeping other factors constant 2. Cut shoot under water; 3. Cut shoot at a slant; 4. Dry off leaves; 5. Insert into apparatus under water; 6. Ensure no air bubbles are present; 7. Shut tap; 8. Note where bubble is at start / move bubble to the start position;	2 max
07	3	Light (intensity)/temperature/air movement/humidity;	1
07	4	1. Water used for support / turgidity; Accept: water used in (the cell's) hydrolysis or condensation (reactions) for one mark. Allow a named example of these reactions 2. Water used in photosynthesis; 3. Water produced in respiration; 4. Apparatus not sealed / 'leaks';	2 max
07	5	Distance and time; Reject 'amount bubble moves' Radius/diameter/area (of capillary tube);	1
07	6	As number of leaves are reduced (no mark),	3 max

	<p>Accept: converse arguments</p> <ol style="list-style-type: none">1. Less surface area;2. Fewer stomata;3. Less evaporation / transpiration;4. Less cohesion / tension / pulling (force);	
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Q	Part	Marking guidance	Total marks
08	1	plants are immobile; aphids act as vectors;	2
08	2	To act as a control ; To ensure it is the virus in the plant that changes its 'attractiveness' to aphids and not simply being fed on by the aphids;	2
08	3	Aphids not carrying the virus prefer infected plants; Aphids carrying the virus prefer healthy plants; No overlap in SD / data is significant;	2
08	4	Aphids not carrying the virus prefer infected plants and will become infected Aphids carrying the virus prefer healthy plants and they will spread the virus	2

Q	Part	Marking guidance	Total marks
09	1	<p>Phagocyte attracted by a substance / chemoattractant / recognises (foreign) antigen;</p> <ol style="list-style-type: none"> 1. accept named substance eg chemical / antigen 2. (Pathogen)engulfed / ingested; 2. Accept: description 3. Enclosed in vacuole / vesicle / phagosome; 4. (Vacuole) fuses / joins with lysosome; 5. Lysosome contains enzymes; 5. Accept named example of enzyme 6. Pathogen digested / molecules hydrolysed; 6. Neutral: Destroyed 	5
09	2	<ol style="list-style-type: none"> 1. Vaccines contain antigens / antigens are injected; 1. Ignore references to T or B cells. 2. Dead pathogens / weakened pathogens; 2. Accept bacteria / viruses etc but not disease 3. Memory cells made; 4. On second exposure memory cells produce antibodies / become active / recognise pathogens; 4. Idea of memory cells responding. 5. Rapidly produce antibodies / produces more antibodies; 5. Production of antibodies must be qualified for mark. Underlined ideas essential. 6. Antibodies destroy pathogens; 6. Accept bacteria/viruses etc but not disease 	5