OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL A-LEVEL BIOLOGY

(9610)

PAPER 1
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	Golgi (apparatus / body);	1
01	2	1. Nucleus; 2. Mitochondrion; 3. Endoplasmic reticulum / ER; 4. Lysosome;	2 max
01	3	(Aerobic) respiration / ATP production / provide energy; *Accept Krebs cycle / electron transport.* *Ignore 'produces energy'* *Reject anaerobic respiration* *Ignore what energy is used for*	1
01	4	1. High / better resolution; 2. Shorter wavelength; 3. To see internal structures / organelles / named organelles; *Accept ultrastructure*	2 max

Q	Part	Marking guidance	Total marks
02	1	Group of similar organisms / organisms with similar features; Reproduce / produce offspring; That are fertile;	2 max
02	2	Produces a more reliable mean / average / makes sure sample was representative / reduce effect of extreme values;	1
02	3	Removes bias	1
02	4	Clearly shows formula for index of diversity as $\text{Index of diversity} = \frac{N\,(N-1)}{\sum n\,(n-1)}$; Clearly shows denominator as 834; Index of diversity as 2.7;	3

02	5	Answer links rain fall with greater variety of plants / greater number of species of plants; Answer links diversity of ants with greater range of seed type / seed size;	2

Q	Part	Marking guidance	Total marks
03	1	trachea	1
03	2	1. Flatten / moves down; 2. (Diaphragm muscle) contracts;	2
03	3	1. Diaphragm contracts / moves down / flattens; 2. Increases volume (of thorax); 3. Decrease in pressure; 4. Air moves from high to lower pressure / down pressure gradient;	3 max
03	4	1. Diffusion; 2. Across (alveoli) epithelium / (capillary) endothelium;	2 max

Q	Part	Marking guidance	Total marks
04	1	1. (Enzyme has) <u>active site</u>; 2. Only substrate fits (the active site);	2
04	2	same temperature conc of enzyme pH	2
04	3	denatured enzyme / using no enzyme	1
04	4	To ensure that the change is as a result of the enzyme	1
04	5	Increases then plateaus/constant/steady/rate does not change; Correct reference. to 27/28 units; e.g. increases up to/plateaus at 27/28	2
04	6	Substrate concentration/amount of substrate;	2

		As substrate concentration increases, rate increases/positive correlation (between rate and substrate concentration);	

Q	Part	Marking guidance	Total marks
05	1	1. Crush / grind; 2. With ethanol / alcohol; 3. Then add water/then add to water; *Water must be added <u>after</u> ethanol for third mark.* 4. Forms emulsion / goes white / cloudy; *Do not accept carry out emulsion test.*	3
05	2	4 / four;	1
05	3	1. Phosphate / PO_4; *"It" refers to phospholipid.* 2. Instead of one of the fatty acids / and two fatty acids;	2
05	4	1. Double bonds (present); *Answer refers to unsaturated unless otherwise clearly indicated.* 2. Some / two carbons with only one hydrogen / (double bonds) between carbon atoms / not saturated with hydrogen; *1 and 2. May be shown in appropriate diagram.* 3. In (fatty acid) C / 3;	2 max

Q	Part	Marking guidance	Total marks
06	1	Lengthways/down the root; Through one tissue only / through same part / same proportion of tissues;	2
06	2	To prevent the water from evaporating / prevent evaporation; Changing the concentrations / water potential (of solution);	2
06	3	Plot data on a graph; Find (sucrose concentration) from the graph where the ratio is 1;	2
06	4	No, because the results are given as a ratio/as a proportion of initial length;	1

Q	Part	Marking guidance	Total marks
07	1	(So results) can be compared/so measurement is the same each time/because eye is not perfectly round/uniform;	1
07	2	1. Eye (diameter) is smaller and antennae longer; 2. Antennae detecting touch; 3. Data only refers to shrimps/data may not apply to all animals/only in one area; *The principle here is that candidate has recognised that both features confirm suggestion. Exact wording does not matter.*	2 max
07	3	1. Standard deviation gives a measure of spread/variation; 2. More standard deviations overlap, the less likely it is that differences are real/significant/the more likely they are caused by chance;	2
07	4	(No) for same body length, antenna are longer/antenna are shorter/some with longer body have short antennae/some with shorter body length have longer antennae; **OR** (Yes) positive correlation in open/in cave;	1
07	5	More alleles of each gene/shrimps in open have all the alleles;	1

Q	Part	Marking guidance	Total marks
08	1	2 marks for correct answer of 6 (correctly identifying that one cycle takes 10 seconds); Award 1 mark for incorrect answers that have divided 60 by any number;	2
08	2	Sharp decrease and then oxygen concentration plateaus Graph needs to be amended	2
08	3	Increasing carbon dioxide concentration / partial pressure; As the concentration of oxygen at that point remains constant	2

08	4	Correct answer of 342.8 − 343 = 2 marks;; Credit incorrect answers that show the numerator as 144 (or 186-42) or denominator as 42 for 1 mark;	2

08	5	1. More air / oxygen enters / air / oxygen enters quickly / quicker; *1. Accept: converse for carbon dioxide* *1. Can be in any correct context eg insect, tracheoles, muscle* *1. Neutral: air/oxygen enters* (So) maintains / greater diffusion or concentration gradient;	2

Q	Part	Marking guidance	Total marks
09	1	glycosidic	1
09	2	31 or 31.2;	1
09	3	Ratio would be less/smaller; Cell is thin / has large surface area / (adapted) for diffusion; *Accept converse. Must relate to concept of ratio.*	2
09	4	6;	1
09	5	11;	1
09	6	Water potential inside vesicle more negative/lower; Water moves into vesicle by osmosis/diffusion;	2
09	7	Mitochondria supply energy/ATP; For active transport / absorption against concentration gradient / synthesis / anabolism / exocytosis / pinocytosis; *Do not credit references to making, creating or producing energy.*	2