OXFORD AQA
INTERNATIONAL QUALIFICATIONS

INTERNATIONAL AS
BIOLOGY (9610)
BL01

Unit 1 The Diversity of Living Organisms

Mark scheme

January 2026

Version: 1.0 Final

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 Examiner.

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.

Further copies of this mark scheme are available from oxfordaqa.com

Mark scheme instructions to examiners

1. General

The mark scheme for each question shows:

- the marks available for each part of the question
- the typical answer or answers which are expected
- extra information to help the examiner make his or her judgement and help to delineate what is acceptable or not worthy of credit.

The extra information in the 'Comments' column is aligned to the appropriate answer in the left-hand part of the mark scheme and should only be applied to that item in the mark scheme. At the beginning of a part of a question a reminder may be given, for example: where consequential marking needs to be considered in a calculation; or the answer may be on the diagram or at a different place on the script.

In general the right-hand side of the mark scheme is there to provide those extra details which confuse the main part of the mark scheme yet may be helpful in ensuring that marking is straightforward and consistent.

2. Emboldening

2.1 In a list of acceptable answers where more than one mark is available 'any **two** from' is used, with the number of marks emboldened. Each of the following bullet points is a potential mark.

2.2 A bold **and** is used to indicate that both parts of the answer are required to award the mark.

2.3 Alternative answers acceptable for the same mark are indicated by the use of **OR**. Different terms in the mark scheme are shown by a/; eg allow smooth/free movement.

3. Marking points

3.1 Marking of lists

This applies to questions requiring a set number of responses, but for which students have provided extra responses. The general principle to be followed in such a situation is that 'right + wrong = wrong'.

Each error/contradiction negates each correct response. So, if the number of errors/contradictions equals or exceeds the number of marks available for the question, no marks can be awarded.

However, responses considered to be neutral (often prefaced by 'Ignore' in the 'Comments' column of the mark scheme) are not penalised.

3.2 Marking procedure for calculations

Full marks can be given for a correct numerical answer, without any working shown.

However, if the answer is incorrect, mark(s) can usually be gained by correct substitution/working and this is shown in the 'Comments' column or by each stage of a longer calculation.

3.3 Interpretation of 'it'

Answers using the word 'it' should be given credit only if it is clear that the 'it' refers to the correct subject.

3.4 Errors carried forward, consequential marking and arithmetic errors

Allowances for errors carried forward are most likely to be restricted to calculation questions and should be shown by the abbreviation ECF or consequential in the mark scheme.

An arithmetic error should be penalised for one mark only unless otherwise amplified in the mark scheme. Arithmetic errors may arise from a slip in a calculation or from an incorrect transfer of a numerical value from data given in a question.

3.5 Phonetic spelling

The phonetic spelling of correct scientific terminology should be credited **unless** there is a possible confusion with another technical term.

3.6 Brackets

(…..) are used to indicate information which is not essential for the mark to be awarded but is included to help the examiner identify the sense of the answer required.

3.7 Ignore/Insufficient/Do <u>not</u> allow

Ignore or insufficient is used when the information given is irrelevant to the question or not enough to gain the marking point. Any further correct amplification could gain the marking point.

Do **not** allow means that this is a wrong answer which, even if the correct answer is given, will still mean that the mark is not awarded.

Question	Marking guidance	Mark	Comments
01.1	Allow range 0.567- 0.580µm;;	2	Allow any number of decimal places Allow one mark for candidates A-B/150000 AND correct corresponding answer

Question	Marking guidance	Mark	Comments
01.2	Capsule;	1	Allow slime layer

Question	Marking guidance	Mark	Comments
01.3	1. Circular (in bacteria); 2. Not associated with proteins/histones; 3. Shorter; 4. Has no introns;	2 max	1. Ignore plasmids

Question	Marking guidance	Mark	Comments
01.4	1. Found in cytoplasm in bacteria; 2. Found in plasmids in bacteria; 3. Not found in mitochondria;	2 max	1. Not found in the nucleus

Question	Marking guidance	Mark	Comments
01.5	Lung cells do not have cell walls/murein;	1	

Question	Marking guidance	Mark	Comments
01.6	1. Diaphragm relaxes **and** moves upwards/becomes dome shaped; 2. (External) intercostal muscles relax and ribs move downwards /inwards; 3. Decrease in volume and increase in pressure (in the lungs);	3	2. Allow internal intercostal muscles contract and ribs move downwards/inwards

Question	Marking guidance	Mark	Comments
02.1	1. Draw a line/origin on the chromatography paper close to the bottom (1–3 cm up) in pencil; 2. Add the pigments (solution) to line/origin; 3. Allow to dry and repeat adding extract; 4. Add the solvent (to the test tube/tank) below the sample; 5. (Suspend so) paper doesn't touch the sides; 6. Add bung/lid (to prevent evaporation); 7. Mark the final position of the solvent front (immediately);	4 max	

Question	Marking guidance	Mark	Comments
02.2	Solvents/chemicals are toxic/hazardous/flammable;	1	

Question	Marking guidance	Mark	Comments
02.3	1. Two pigments have the same/similar solubility in (solvent) **1**; 2. But the two pigments have different solubility in (solvent) **2**;	2	For **two marks** must mention solubility at least once

Question	Marking guidance	Mark	Comments
02.4	F **and** As it travelled the furthest distance;	1	 Allow has the highest R_f

Question	Marking guidance	Mark	Comments
02.5	**For 2 marks:** 0.55 – 0.58;; **For 1 mark:** Incorrect rounding; **OR** Between 46÷84 to 49÷84 **OR** ± 0.02 either side of the range;	2	1. Allow 0.583.

Question	Marking guidance	Mark	Comments
02.6	1. Biuret (reagent/test); 2. Turns purple;	2	Allow sodium hydroxide NaOH and copper sulphate /$CuSO_4$

Question	Marking guidance	Mark	Comments
02.7	Any **one** from: 1. The plant extract is green 2. Each pigment has its own colour 3. Solvent may affect the colour change 4. The pigments are not proteins;	1	Ignore idea of too little protein present

Question	Marking guidance	Mark	Comments
03.1	More than one (poly)peptide chain;	1	Allow four polypeptides but not other numbers Ignore ref to prosthetic group

Question	Marking guidance	Mark	Comments
03.2	Haem group;	1	Allow prosthetic group

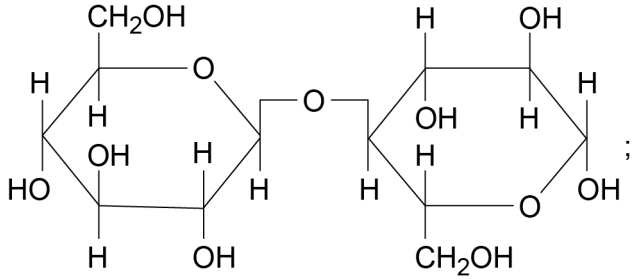
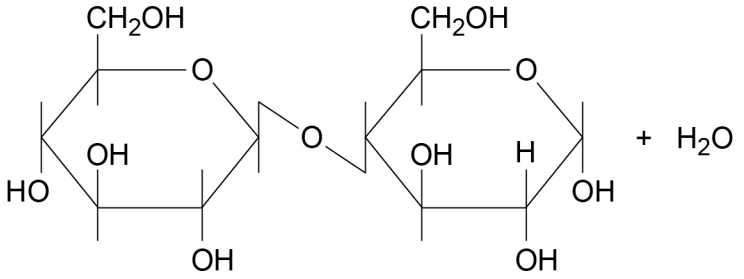
Question	Marking guidance	Mark	Comments
03.3	423;	1	Allow 426, 429

Question	Marking guidance	Mark	Comments
03.4	56(%);	1	Allow 58–54

Question	Marking guidance	Mark	Comments
03.5	1. (Haemoglobin) dissociates/unloads oxygen more readily/has a lower affinity for oxygen; 2. More oxygen (released to the muscle) for (aerobic) respiration **OR** More oxygen prevents anaerobic respiration/lactic acid production; 3. Release energy for muscle <u>contraction</u>;	3	3. Allow more ATP for muscle <u>contraction</u> 3. Do not allow produce energy

Question	Marking guidance	Mark	Comments
03.6	**Carbon dioxide**: 1. Diffusion; 2. Can move through the phospholipid bilayer; **Hydrogen carbonate ions**: 3. Facilitated diffusion/active transport; 4. Needs a channel/carrier protein;	4	

Question	Marking guidance	Mark	Comments
03.7	1. Different base/DNA sequences; 2. Different primary structure/different sequence of amino acids **OR** Contains different amino acids; 3. Named bonds form in different places e.g. ionic/disulfide/hydrogen/hydrophobic;	2 max	1. Allow the gene for haemoglobin may have mutated 3. Allow correct reference to chaperone protein

Question	Marking guidance	Mark	Comments
04.1	1.  ; 2. H_2O/water/correct diagram of water;	2	Allow incomplete/incorrect second molecule if it has been inverted **and** if the glycosidic bond is correct Allow non-inverted second molecule if bond drawn reflects this e.g. 

Question	Marking guidance	Mark	Comments
04.2	1. Forms long/straight/unbranched (chains); 2. Forming (micro/macro) fibrils; 3. (Many) hydrogen bonds linking (chains/(micro/macro)fibrils); 4. Which provide rigidity/strength/support to cell walls;	4 max	2. Allow (micro/macro) fibres 4. Allow cell wall can resist turgor pressure/osmotic pressure/pulling forces 4. Do not allow if any extra wrong function is stated – e.g. supports the cell wall and is partially permeable

Question	Marking guidance	Mark	Comments
04.3	Must be comparative Only award **three marks** if similarities **and** differences present **Similarities**: 1. Both are polymers/polysaccharides/built up from many sugar units; 2. Both contain Carbon, Hydrogen and Oxygen; 3. Both contain (β–) glucose; 4. Both have hydroxyl groups (attached to C in ring); 5. Both have glycosidic bonds; **Difference**: 6. Cellulose is only formed from β–glucose; 7. Hemicellulose is branched (and cellulose is not); 8. Rings in hemicellulose can have COOH/CH3 (and cellulose does not); 9. Hemicellulose contains pentose/5 carbon sugar;	3 max	3. Allow both have alternating orientation of monomers/sugars/monosaccharides 5. Do not allow both contain 1,6 glycosidic bonds

Question	Marking guidance	Mark	Comments
04.4	**X**: Lipid; **Y**: Starch;	2	**X**: Allow fat/triglyceride/fatty acids for lipid

Question	Marking guidance	Mark	Comments
04.5	1. **Cellulose**: Test: Schultz Colour produced: Purple; 2. **Hemicellulose**: Test: Bial's (test) Colour produced: Green-blue;	2	Need correct test and colour for mark

Question	Marking guidance	Mark	Comments
04.6	1. Substance might be in too small concentrations; 2. Proteins/nucleic acids/**non-**reducing sugar/vitamin C etc are not detected using any of the tests in the table; 3. Several substances present, so colours (of test results) interfere;	2 max	2. Must be named biological molecule not present in table 2. Ignore reference to testing for reducing sugars 3. Allow natural colour of the food hides colour change

Question	Marking guidance	Mark	Comments
05.1	Max of **two marks** from each section **Similarities**: 1. Both contain ester bonds (between glycerol and fatty acid); 2. Both contain glycerol and fatty acids; 3. Fatty acids on both may be saturated or unsaturated; **Differences**: 4. Only phospholipids also contain P/phosphorus/phosphate; 5. Triglyceride has three fatty acids and phospholipid has two fatty acids;	3 max	Allow mark points shown on adjacent annotated diagrams

Question	Marking guidance	Mark	Comments
05.2	1. (To control for) different starting mass (of tissue sample); 2. Allow for a (valid) comparison;	2	1. Ignore references to number of fatty acids

Question	Marking guidance	Mark	Comments
05.3	4.3;	1	Allow correct rounding of 4.2631579

Question	Marking guidance	Mark	Comments
05.4	**For two marks:** 2.4;; **For one mark:** Correct answer with wrong number of significant figures e.g. 2.398, 2.40, 2.42, 2 **OR** Incorrect fallow deer ratio (i.e. not 1.78) **and** correct calculation **and** sig figs using answer from 05.3;	2	Allow e.c.f. from 05.3

Question	Marking guidance	Mark	Comments
05.5	**Supports**: 1. Red (and roe) deer have the higher percentage of unsaturated fats and are found in the areas with the lower ground surface temperature **OR** Fallow deer have the lower percentage of unsaturated fats and are found in the areas with the higher ground surface temperature; **Does not support**: 2. Roe/fallow deer also found in Scotland/North/top of map/colder areas **OR** 3. Idea that the data are unclear e.g. all three species found in all regions;	2 max	1. Allow (In general), as the mean ground surface temperature decreases, the mean percentage/ratio of unsaturated fatty acids increases/eq 1. Allow inversely proportional or negative correlation if qualified 2. Allow red/roe deer also found in warmer areas

Question	Marking guidance	Mark	Comments
05.6	1. Red deer (mostly) found in colder areas; 2. Toes exposed to more cold/further from core eq; 3. Unsaturated fatty acids have lower melting point; 4. More likely to be liquid/fluid in the cold; 5. (Therefore) cell membranes have the same properties/fluidity in the different parts of the leg;	3 max	

Question	Marking guidance	Mark	Comments
06.1	**Same species**: 1. Can interbreed and produce fertile offspring; 2. Have the same chromosome structure/number; 3. Similar genomes/loci/DNA; **Different species**: 4. Different morphology/appearance; 5. Male hybrids/offspring can be infertile; 6. Different genomes/loci; 7. Some hybrids/offspring die **OR** Genes are incompatible;	5 max	Do not award both mp3 and 6 Ignore different genus/binomial name different

Question	Marking guidance	Mark	Comments
06.2	Have (XY) chromosomes which can't pair during meiosis **OR** don't have homologous chromosomes **OR** can't produce (viable) gametes;	1	

Question	Marking guidance	Mark	Comments
06.3	6.25 (%);	1	Allow 6/6.3

Question	Marking guidance	Mark	Comments
06.4	1. 7% of Bengal loci without any Asian leopard cat genes/alleles; 2. Asian leopard cat genes/alleles not compatible **OR** Hybrids with some Asian leopard cat genes/alleles can die; 3. (Therefore) Asian leopard cat genes/alleles not passed on/not kept in the gene pool;	2	2. Allow genetic drift 2. Allow converse 2. Ignore references to continued breeding with domestic cat beyond creation of Bengal 3. Allow (usually) only domestic cat genes/alleles are passed on

Question	Marking guidance	Mark	Comments
06.5	Last common ancestor more recent in Bengals **and** idea of less time for mutations/changes to DNA **OR** Less time for differences in chromosomes, to accumulate;	1	Allow converse for ligers