CAMBRIDGE
International Education

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ENVIRONMENTAL MANAGEMENT **0680/21**

Paper 2 Management in Context **October/November 2024**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	‘List rule’ guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Question	Answer	Marks
1(a)	16.6 / 17;	**1**
1(b)	*any three from:* both **overall** decreasing rate; both fluctuate; rate of total population growth is less (than rate of urbanisation); relevant comparative data quote;	**3**
1(c)(i)	sulfur dioxide / acid rain;	**1**
1(c)(ii)	*any two from:* (atmospheric pollutant from exhaust gas of) combustion of fossil fuels; gas through a scrubber; (sulfur dioxide is dissolved) to form sulfurous / sulfuric acid; reaction or neutralisation with, lime / limestone / calcium carbonate;	**2**
1(d)	*any one from:* more people leaving Türkiye than arriving / emigration greater than immigration; stated reason for leaving e.g. lack of work / jobs;	**1**
1(e)	*any two from:* narrow base; wider in the middle; top of pyramid high / tall; more elderly females than males;	**2**
1(f)	*any two from:* woman delay having children / more opportunities; improved knowledge on family planning; AVP; g. high costs of education / less children needed to support family	**2**

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Question	Answer	Marks
2(a)	largest sector first starting at 'noon'; sectors in clockwise rank order; correct plotting; key competed and matches sector shading;	**4**
2(b)(i)	*any three from:* timber extraction / logging; farming / agriculture; roads / infrastructure; towns / homes / businesses; mineral extraction;	**3**
2(b)(ii)	*any two from:* genetic depletion; soil erosion; desertification; climate change;	**2**
2(c)(i)	*any one from:* increase economy / raises money (for country); jobs; recycling / extraction of raw materials; AVP; e.g. burning to capture energy	**1**
2(c)(ii)	*any two from:* waste could be toxic; leaching into soil / water; expensive (to deal with waste); increases a named form of pollution; landfills become full / lack of space;	**2**
2(d)	use of microorganisms / plants / microbes / enzymes; to remove toxic chemicals;	**2**

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Question	Answer	Marks
2(e)	*any two from:* provide recycling bins; educating public; fines / financial incentives; e.g. charge for using plastic bags build (more) recycling centres; AVP e.g. legislation;	**2**
2(f)	meeting the needs of current generation; without comprising needs of future generations;	**2**

Question	Answer	Marks
3(a)	cash crop;	**1**
3(b)	not all of producer, consumed / ingested / digested / absorbed / assimilated;	**1**
3(c)(i)	2nd and 4th trees circled in each row;	**1**
3(c)(ii)	systematic;	**1**
3(d)(i)	variety **C**, apricot 4;	**1**
3(d)(ii)	3;	**1**
3(d)(iii)	173 ÷ 4 or 43.25 / 43.3; 43;	**2**
3(d)(iv)	remove the skin **AND** stone; measurement of mass of **flesh**; compare (mean / average) mass (of flesh) with other varieties;	**2**
3(e)(i)	16;	**1**
3(e)(ii)	4;	**1**

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Question	Answer	Marks
3(e)(iii)	18.2;	**1**
3(e)(iv)	2;	**1**
3(f)	*any two from:* less waste from fruit; (not relying on one) form of income; less demand fossil fuel; biofuels are renewable;	**2**
3(g)(i)	*any two from:* cost; concern over leaching; concern over impact on non-target species; want to grow organically; AVP; e.g. use biological control / prevents bioaccumulation / biomagnification / prevents insect resistance	**2**
3(g)(ii)	*any one from:* *idea of where to spray:* only need to spray on trees that contain the moths; *idea of when to spray:* only need to spray when moths are present;	**1**
3(h)	**anther** circled;	**1**

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Question	Answer	Marks
4(a)(i)	*any three from:* less salt water from 1988 to 2016 or to 2020; 2016 has no salt water; increase in salt water from 2016 to 2020; more dry salt deposits 2016; more marsh in 2016 or 2020 (than 1988); AVP; see guidance	**3**
4(a)(ii)	*any three from:* climate change / global warming / increased temperatures; less rain; (poor) irrigation (from sources); drought; diverted water source / lake drained;	**3**
4(b)	select the desired characteristic (in a salt tolerant plant); cut out the gene (for the characteristic from the chromosome); insert the gene into another organism;	**3**
4(c)(i)	calculate the **mean** (for the number of flamingos in 10 squares); multiply this number by 100;	**2**
4(c)(ii)	*any two from:* lake is too large to see all of area; large numbers in the sky; only count the birds that fly on one day; count the same bird more than once; young flamingos cannot fly; time consuming;	**2**

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Question	Answer	Marks
4(c)(iii)	*any two from:* not all flamingos in nests / not all nests produce young; some nests may be abandoned or last years; number of flamingos per nest varies; nests camouflaged / not around the lake; lake too large to walk around in one day / time consuming; the number of nests does not equal the number of flamingos AVP; e.g. may count other types of bird nests	**2**
4(d)	*any two from:* enables breeding / survival of young (increased in captivity); no hunting of young / no predators / food provided / health of birds can monitored; released back into the wild	**2**
4(e)	*any two from:* reserves / national parks; corridors; ban hunting;	**2**

Question	Answer	Marks
5(a)(i)	boom;	**1**
5(a)(ii)	*any two from:* suffocation; blocks gills; covers feathers / skin / eyes; spreads disease; disrupts food chains; toxic (if ingested);	**2**

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Question	Answer	Marks
5(a)(iii)	*any two from:* reduces tourism; reduces fishing yields; economic impact; people can't swim in the sea; AVP;	**2**
5(b)(i)	to kill, bacteria / microbes / microorganisms;	**1**
5(b)(ii)	typhoid / cholera / diarrhoea / any correctly named infectious water–related disease;	**1**
5(c)	B → E → F → C → (D A); 4 correct = [2] 2–3 correct = [1]	**2**
5(d)	reactants: glucose AND oxygen; products: carbon dioxide AND water;	**2**

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