Cambridge O Level

Cambridge Assessment International Education
Cambridge Ordinary Level

ENVIRONMENTAL MANAGEMENT **5014/22**

Paper 2 **October/November 2018**

MARK SCHEME

Maximum Mark: 60

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.

Cambridge International is publishing the mark schemes for the October/November 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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 descriptors 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.

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.

Question	Answer	Marks
1(a)(i)	5.3;	**1**
1(a)(ii)	6 (°C);	**1**
1(a)(iii)	(19.5 + 3 =) 22.5 / 23 ;; (*if answer incorrect, allow one mark for 0.6 × 5 = 3 (°C) [1]*);	**2**
1(b)(i)	photosynthesis;	**1**
1(b)(ii)	*any two from:* Farm **A** warmer at a lower altitude / Farm **B** cooler at a higher altitude; faster growth (in warmer climate) / faster development; further details, e.g. rate of metabolism / flower earlier / ripen faster;	**2**
1(b)(iii)	*any two from:* low average rainfall; so fertiliser not washed off fields; so fertiliser not wasted; so fertiliser can be absorbed (as tree grows); needed to develop, flowers / fruit;	**2**
1(b)(iv)	*any three from:* fertilisers, leached / washed off field due to rainfall; (enters rivers / streams) causes eutrophication; algal bloom; which blocks light; death of plants due to lack of light; increase in bacteria; bacterial respiration; decomposition uses up oxygen; death of fish; disrupts, food chain / food web / reduction in biodiversity;	**3**

Question	Answer	Marks
1(b)(v)	*any three from:* not enough light for growth of crops; too difficult to harvest between trees; cultivation, disturbs / damages trees; competition for water; competition for nutrients; difficult to control pests; economic comment such as, value of avocado crop enough to support farmer / increased cost of, labour / seeds / fertiliser if crops grown as well;	**3**
1(c)	*both benefits for farmers and benefits for the government must be covered for maximum credit:* *max two from, benefits for farmers:* farmers, can always sell all the crop / have access to bigger market; make more money; invest in more, equipment / fertiliser / education / healthcare; *max two from, benefits for the government:* government collect taxes; improved, economic growth / GDP; so can spend money on infrastructure;	**3**
1(d)(i)	(0.17 / 1.47 × 100 =) 11.56 / 11.6 (%) ;; (*if answer incorrect, allow one mark for 1.64 – 1.47 = 0.17 [1]*);	**2**
1(d)(ii)	*any four from:* reduced interception; reduced infiltration; (increased) surface run-off; soil no longer held in place by roots; soil washed away; trees act as wind breaks; wind blows soil away;	**4**

Question	Answer	Marks
1(d)(iii)	produce hybrids / by cross pollination / selective breeding; genetic manipulation / genetic modification / gene transfer / genetic engineering;	**2**
1(e)(i)	192;	**1**
1(e)(ii)	62.54 / 62.5 / 63;	**1**
1(e)(iii)	be careful, with knife / cutting the fruit;	**1**
1(e)(iv)	*any two from:* use seeds to grow more trees; use to make compost / manure; use as animal feed;	**2**

Question	Answer	Marks
2(a)(i)	suitable linear scale; y axis fully labelled including units; x axis fully labelled; correct plots;	**4**
2(a)(ii)	the price (of copper) decreases (with time);	**1**
2(a)(iii)	*any two from:* too many copper mines operating / (world) oversupply of copper / recycling copper; less demand for copper; description of reduced demand, e.g. using alternative materials; local protests stop copper mining;	**2**
2(b)(i)	*any two from:* deposit not as big as first thought; not going to be profitable; AVP, e.g. unforeseen geological / environmental issue, such as underground flooding / dispute over mining rights / land ownership;	**2**

Question	Answer	Marks
2(b)(ii)	to make sure that mining can take place without doing too much damage to the environment / OWTTE;	**1**
2(b)(iii)	*any three from:* holes can be filled with, waste rock / overburden; landfill; landscape / spoil heaps, can be shaped; covered with soil; and soil planted; use plants that absorb toxins; reference to, safe drainage through soil heaps; AVP, e.g. National Park / wildlife reserve;	**3**
2(c)(i)	*any two from:* they want employment; all year round; better paid; named example of raising their standard of living, e.g. better housing / infrastructure; job security for 12 years; risk of being caught illegal logging;	**2**
2(c)(ii)	*any two from:* stable income / mining better paid (than logging); so reduced logging; people do not need to do illegal logging to earn money;	**2**
2(c)(iii)	*any three from:* mining produces toxic waste; their drinking water may become toxic; toxic materials kill the, fish / organisms in the river; could poison, humans / stock animals; reduce crop growth;	**3**
2(d)(i)	select at random / stratified sampling / AVP; further description on how it is done, e.g. volunteer sampling;	**2**

Question	Answer	Marks
2(d)(ii)	*any two from:* they earn money / it provides jobs (from working in hotels / tour guides / souvenir selling, etc.); to pay for, school / medical care / other named example; better infrastructure for everyone; help people learn another language;	**2**
2(d)(iii)	*any two from:* (they think) the butterfly is being protected; and tourists cannot visit other sites / can only visit two, sites / zones / controlled areas; tourists only visit in winter; it is ecotourism;	**2**
2(d)(iv)	*question about tourism such as,* Do you sell butterflies? / Do you earn money from tourists? / Do you work in tourism? / Do tourists want to see other species? ;	**1**
2(e)	*any two from:* raise awareness of the butterfly within Mexico; and in other parts of the world the tourists come from; AVP, e.g. generates money for conservation;	**2**