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**ENVIRONMENTAL MANAGEMENT****0680/42**

Paper 4

**March 2018**

MARK SCHEME

Maximum Mark: 60

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**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 March 2018 series for most Cambridge IGCSE<sup>®</sup>, Cambridge International A and AS Level components and some Cambridge O Level components.

**PUBLISHED****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.

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)	4.5 (million);	<b>1</b>
1(b)	<i>any two from:</i> energy (supply); food (supply); clothing; medical care; shelter; sanitation / good sewage disposal; AVP, e.g. education / clean air;	<b>2</b>
1(c)(i)	<i>any two from:</i> in centre, low population / less than 2.1; in south, high population / more than 5.1; high population near, major towns / capital city; highest population / more than 20.1 per km, is north of Astana / eq;	<b>2</b>
1(c)(ii)	<i>any two from:</i> employment; trade / industry (across the border); river / water, in the desert (for irrigation); extraction / mining, of raw materials; major road / good transport;	<b>2</b>
1(d)	<i>any three from:</i> (between 1925 and 1955) large movement from rural to urban; urban and rural % population is equal in 1955; movement stabilises / fluctuates, after 1955; in 1925 most people lived in rural areas, by 2015 more people lived in urban areas; AVP;	<b>3</b>

Question	Answer	Marks
1(e)(i)	<p><i>any two from:</i> to increase trade; employment to build the railway / more employment opportunities; faster transport; increased tourism; increased, taxes / revenue; AVP, e.g. development of other infrastructure / increase in international cooperation;</p>	<b>2</b>
1(e)(ii)	<p><i>any two from:</i> create new, protected areas / wildlife reserve / national parks / world biosphere reserves; build fences around the railways; build tunnels under the railway; laws to protect the Ass; wildlife wardens; AVP, e.g. no train stops where the Wild Ass lives;</p>	<b>2</b>
1(e)(iii)	<p><i>any two from:</i> scientific research / field projects / conservation projects; increase, public awareness / education; raise funds (to conserve species); help develop, policies / laws / best practice with governments;</p>	<b>2</b>
1(e)(iv)	<p><i>any one from:</i> need agreement between all countries involved; expensive; AVP, e.g. war / public protest;</p>	<b>1</b>
1(f)(i)	<p><i>any two from:</i> small sample / only 20 people; only one, street / area; only one, city / Almaty sampled; data will be biased;</p>	<b>2</b>

Question	Answer	Marks
1(f)(ii)	<i>any two from:</i> more people / bigger sample / 160 compared to 80 or 20; both towns sampled; all areas sampled / N,S,E,W of city sampled / data is representative;	<b>2</b>
1(f)(iii)	<i>any three suitable questions: e.g.</i> Which city / part of the city, do you live in?; Before / after the change, did you think it was a good idea?; What has been a benefit of the change?; What has been a negative effect of the change?;	<b>3</b>
1(f)(iv)	<i>any one from:</i> use, random / systematic / opportunity / stratified sampling; any detail of suitable method described, e.g. select from people who were around at time / phone book list / people over 18 / stated age groups / different occupations;	<b>1</b>
1(g)(i)	<i>any four from:</i> shops or businesses destroyed; damage to transport (effects trade); reduced / limited, availability of workforce to repair the damage; cost of rebuilding; loss of, government income / tax; government investment concentrated on rebuilding; time to rebuild; disruption to, communications / electricity / maintaining infrastructure; cost of, medical care / emergency services to the injured; AVP, e.g. looting / disruption to government business / decisions / cost of evacuation;	<b>4</b>
1(g)(ii)	<i>any four from:</i> always lived there / cultural heritage; nowhere to go / cost to move; family; employment / investment in business; low perceived threat / think it won't happen again / not worried about earthquakes; trust in, earthquake protection / buildings resistant;	<b>4</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(h)	<i>any three from:</i> radioactive material, remains / stays dangerous for a long time / long half life;  radioactivity seeps into, rivers / groundwater;  risk of (named) cancer / or valid named health concern related to radiation;  risk to future generation;  effect on, crops and livestock / food chain;  terrorist threat;	<b>3</b>

Question	Answer	Marks
2(a)(i)	90% circled;	<b>1</b>
2(a)(ii)	<i>any three from:</i> high salinity levels; fish / aquatic animals, died; plants died; food chains / webs, collapsed / disrupted / altered; decreased biodiversity / increase in extinction; increase in salt tolerant species;	<b>3</b>
2(b)	<i>any three from:</i> overcrowding; noise pollution; poor sanitation / limited health care; risk of, disease / cholera outbreak / respiratory disease; no, services / gas / electricity; no clean drinking water; risk of building, collapse / destroyed by fire / blown down; lack of security / increased crime; family breakdown (with people living separately); often illegal / risk of clearance / eviction by authorities;	<b>3</b>
2(c)(i)	column headings and units; all data correct;	<b>2</b>
2(c)(ii)	field 4 <b>AND</b> highest yield;	<b>1</b>
2(c)(iii)	pH;	<b>1</b>



Question	Answer	Marks
2(c)(iv)	<p><i>any two from:</i>            water supply;            addition of, fertiliser / mineral nutrients;            type / variety, of sugar beet;            soil type;            addition of pesticides;            planting density;            need to repeat / use more fields / more soil types;            set up a controlled experiment (with known soil pH);</p>	2
2(d)(i)	5 (months);	1
2(d)(ii)	37.3 (°C);	1
2(d)(iii)	<p><i>any four from:</i>            temperature falls below zero / goes down to –16.6 / average temperature only 2.2 °C / 7 months below 6 °C;  <b>so</b> plants, can't grow / be planted;            ground will be frozen / permafrost for part of the year;            lack of precipitation / low rainfall all year / 308 mm;            water is unavailable / frozen, for five months / part of the year;            short growing season;</p>	4
2(e)	<p><i>proposals:</i>            introduce kambala fish;            plant saxaul trees;            invest in new irrigation techniques;            alter river flow <b>back</b> to the sea;            apply to World Bank for loan;            control waste disposal;            use biological control instead of pesticides;            control use of inorganic fertiliser / use organic fertilisers;</p> <p><b>ALLOW</b> any valid reason connected to a proposal;;;</p>	5