INTERNATIONAL BACCALAURÉAT BACHILLERATO
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BACCALAUREATE INTERNATIONAL INTERNACIONAL

M03/715/S(1)M

MARKSCHEME

May 2003

ECOSYSTEMS AND SOCIETIES

Standard Level

Paper 1

10 pages

General Marking Instructions

After marking a sufficient number of scripts to become familiar with the markscheme and candidates' responses to all or the majority of questions, Assistant Examiners (AEs) will be contacted by their Team Leader (TL) by telephone. The purpose of this contact is to discuss the standard of marking, the interpretation of the markscheme and any difficulties with particular questions. It may be necessary to review your initial marking after contacting your TL. **DO NOT BEGIN THE FINAL MARKING OF YOUR SCRIPTS IN RED INK UNTIL YOU RECEIVE NOTIFICATION THAT THE MARKSCHEME IS FINALIZED.** *You will be informed by e-mail, fax or post of modifications to the markscheme and should receive these about one week after the date of the examination. If you have not received them within 10 days you should contact your Team Leader by telephone. Make an allowance for any difference in time zone before calling.* **AEs WHO DO NOT COMPLY WITH THESE INSTRUCTIONS MAY NOT BE INVITED TO MARK IN FUTURE SESSIONS.**

You should contact the TL whose name appears on your "Allocation of Schools listing" sheet.

Note:
Please use a personal courier service when sending sample materials to TLs unless postal services can be guaranteed. Record the costs on your examiner claim form.

1. Follow the markscheme provided, do **not** use decimals or fractions and mark only in **RED**.

2. Where a mark is awarded, a tick (✓) should be placed in the text at the **precise point** where it becomes clear that the candidate deserves the mark.

3. Sometimes, careful consideration is required to decide whether or not to award a mark. In these cases write a brief note in the **left hand margin** to explain your decision. You are encouraged to write comments where it helps clarity, especially for moderation and re-marking.

4. Unexplained symbols or personal codes/notations on their own are unacceptable.

5. Record subtotals (where applicable) in the right-hand margin against the part of the answer to which they refer (next to the mark allocation for Section A). Do **not** circle sub-totals. **Circle the total mark for the question in the right-hand margin opposite the last line of the answer.**

6. Where an answer to a part question is worth no marks, put a zero in the right-hand margin.

7. Add together the marks for each question and enter this in the box marked TOTAL in the Examiner column on the front cover of the exam paper.

8. After entering the marks on the front cover check your addition to ensure that you have not made an error. Check also that you have transferred the marks correctly to the front cover. **The IBO carries out script checking and a note of all clerical errors may be given in feedback to examiners.**

9. Every page and every question must have an indication that you have marked it. Do this by **writing your initials** on each page where you have made no other mark.

10. A candidate can be penalized if he/she clearly contradicts him/herself within an answer. Make a comment to this effect in the left hand margin.

Subject Details: Ecosystems and Societies SLP1 Markscheme

General

A markscheme often has more specific points worthy of a mark than the total allows. This is intentional. Do not award more than the maximum marks allowed for part of a question.

When deciding upon alternative answers by candidates to those given in the markscheme, consider the following points:

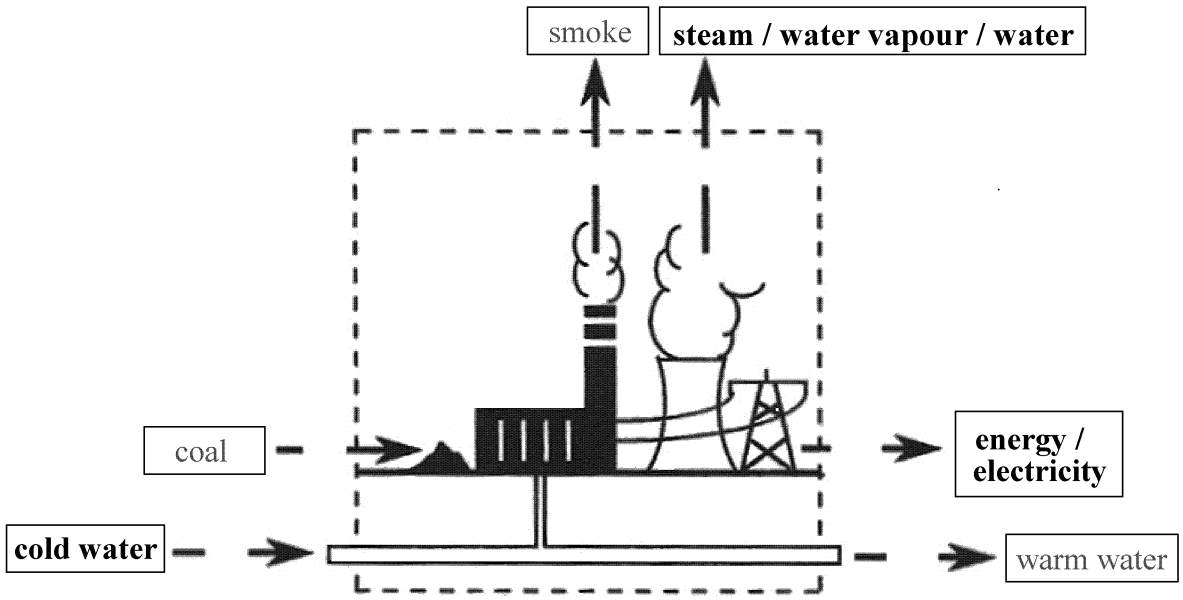
- Each marking point has a separate line and the end is signified by means of a semicolon (;).
- An alternative answer or wording is indicated in the markscheme by a "/" either wording can be accepted.
- Words in (…) in the markscheme are not necessary to gain the mark.
- The order of points does not have to be as written (unless stated otherwise).
- If the candidate's answer has the same meaning or can be clearly interpreted as being the same as that in the mark scheme, then award the mark.
- Mark positively. Give candidates credit for what they have achieved, and for what they have got correct, rather than penalising them for what they have got wrong.
- Remember that many candidates are writing in a second language. Effective communication is more important than grammatical accuracy.
- Occasionally, a part of a question may require a calculation whose answer is required for subsequent parts. If an error is made in the first part then it should be penalized. However, if the incorrect answer is used correctly in subsequent parts then **follow through** marks should be awarded. Indicate this with "**ECF**", error carried forward.
- Units should always be given where appropriate. Omission of units should only be penalized once. Indicate this by "**U-1**" at the first point it occurs. Ignore this, if marks for units are already specified in the markscheme.
- Do not penalize candidates for errors in significant figures, unless it is specifically referred to in the markscheme.

1. (a) (i) feedback that tends to damp down / neutralize / counteract any deviation from an equilibrium, and promotes stability; ***[1]***

(ii) feedback that amplifies / increases change (it leads to exponential deviation away from equilibrium); ***[1]***

(b) most ecosystems contain inbuilt checks and balances;
without internal balance an ecosystem would spiral out of control;
without negative feedback no ecosystem could be self-sustaining; ***[1 max]***

(c)



Three correct ***[2]****, one or two correct* ***[1]****.* ***[2 max]***

2. (a) the amount / range of living diversity per unit area;
including species, habitat and genetic diversity; ***[2]***

(b) (i) number of individuals of a particular species; ***[1]***

(ii) a stable / mature habitat; ***[1]***

(iii) *D* would decrease; ***[1]***

(iv) recent extinction event;
early colonisation;
monoculture;
extreme environmental conditions; ***[1 max]***

(c) (i) a representative sample of quadrats would be laid out within the ecosystem;
all vegetative material would be collected from within the quadrat;
the material would then be weighed;
total biomass can be estimated based on material found within quadrat samples;
method could be repeated several times during the year to compensate for variations in growth rate within seasons (if applicable); ***[3 max]***
Method should be appropriate to the named ecosystem. If a named ecosystem is not stated then mark out of ***[2]****.*

(ii) capture / mark / release / recapture (Lincoln Index);
sampling strategies would need to be representative of variations in habitat;
and seasonal variation in mammal abundance; ***[2 max]***

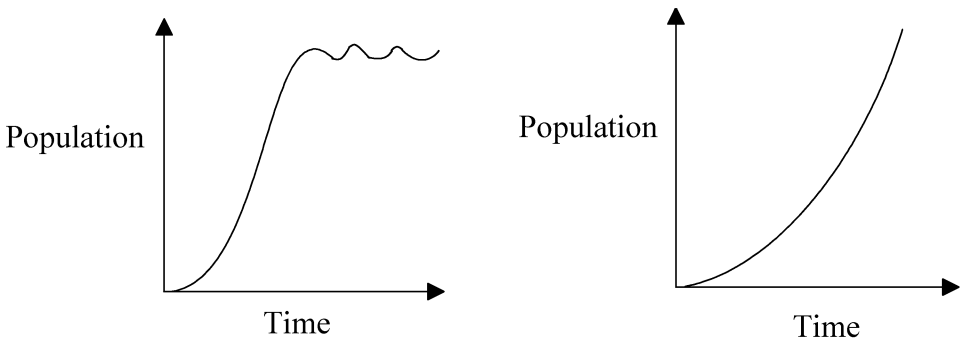
3. (a) a group of organisms that interbreed and produce fertile offspring; ***[1]***

(b) (i) succession; ***[1]***

(ii) a community of plants that has reached a steady state / equilibrium within a particular habitat / environment / the end point in an ecological plant succession;
area C; ***[2]***

(iii) *A range of answers are possible e.g.*
agriculture;
hunting;
clearance / burning;
grazing;
all create a plagioclimax by arresting succession; ***[2 max]***

(c) (i)



[1] *for each curve and* ***[1]*** *for labelling the axes.* ***[2]***

(ii) S curve area A;
J curve area C; ***[2]***

(d) (i) small number of offspring, large amount of parental care;
elephants / apes / humans; ***[2]***
Accept other suitable examples.

(ii) large number of offspring, small amount of parental care;
frogs / salmon / house flies; ***[2]***
Accept other suitable examples.

4. (a) use of a resource at a rate which allows for natural regeneration;
whilst minimizing damage to the environment; ***[2]***

(b) $$\text{SY} = \left(\frac{\text{total biomass}}{\text{energy}} \text{ at time } t+1\right) - \left(\frac{\text{total biomass}}{\text{energy}} \text{ at time } t\right)$$ ***[1]***

(c) *A range of answers may be acceptable e.g.*
war;
countries resources are diverted to armies rather than invested in education / agriculture / development projects;
population expansion;
more resources must be put into sustaining the population rather than development;
national debt;
paying off heavy foreign debts means less money left over for inward investment;
cultural inertia;
culture may not have a philosophy of sustainability (consumerist culture of west or nomadic culture of Africa);
political unrest;
short term thinking predominates but sustainable development is a long term goal; ***[3 max]***
[1] *for both factors and* ***[1]*** *each for brief description of each factor.*

(d) (i) renewable natural capital is natural resources that have a sustainable yield / harvest ≤ their natural productivity;
whereas non-renewable natural capital is natural resources which cannot be replenished within a timescale of the same order as that at which they are taken from the environment; ***[2]***

(ii)

Renewable / replenishable	**Non-renewable**
food crops	oil
timber	gas
wind	coal
solar	natural ore
soil	
ground water	

Mark vertically, ***[1]*** *for each column.* ***[2]***

5. (a) (i) ozone concentration has declined; ***[1]***

(ii) increase of halogenated gases in the atmosphere;
inhibiting the production of ozone; ***[2]***

(b) UV radiation passing through the Earth's upper atmosphere is absorbed by the formation and destruction of ozone;
amount of ozone present (and it's chemical "availability" and temperature) control the amount of UV radiation absorbed; ***[2]***

(c) humans: genetic mutation / skin cancer / cataracts / impaired immune system;
plants: reduced photosynthesis / reduced crop yield due to cell damage; ***[2]***
Accept other valid answers.

(d) use inert gases in refrigeration units;
do not use halogenated organic gases to blow insulation foam;
recycle harmful gases;
dispose of appliances such as refrigerators safely (removing gas);
setting national and international limits; ***[3 max]***