IB DIPLOMA PROGRAMME
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MARKSCHEME

November 2007

ECOSYSTEMS AND SOCIETIES

Standard Level

Paper 1

10 pages

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.
- Words that are underlined are essential for 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) the orderly process of change over time in a community;
changes in the community of organisms cause changes in the physical environment;
this allows another community to become established and replace the former through competition;
leading often to greater complexity; ***[2 max]***

(ii) time;
distance (from sea); ***[1 max]***

(iii) soils will become more mature;
soils will be deeper;
contain more organic material;
become more complex;
develop distinct horizons; ***[2 max]***

(b) positive feedback; ***[1]***

2. (a) as altitude increases rodent <u>species</u> number decreases;
there are fewer rodent <u>species</u> numbers at high altitude;
there are higher rodent <u>species</u> numbers at low altitude;
inverse relationship; ***[1 max]***

(b) migration of species up the mountain;
melting/loss/reduction of snow cap / migration of snowline up mountain;
appearance of new species;
loss of species / species unable to adapt to rapid changes / lower diversity;
increased growth rates; ***[3 max]***

(c) (i)

	Rough grass	*Woodland*	*Bracken*
Wood mice	*6*	*50*	7;
Bank voles	*3*	*15*	23;

[1]

*Both figures needed to receive **[1]**.*

(ii) species' preference for nesting/shelter sites;
preferred food sources located in particular habitats;
rough grassland marginal for both species because it offers little shelter from predators;
mice and voles occupy different niches; ***[2 max]***

(iii) so that the when animals are recaptured population size/Lincoln index can be calculated; ***[1]***

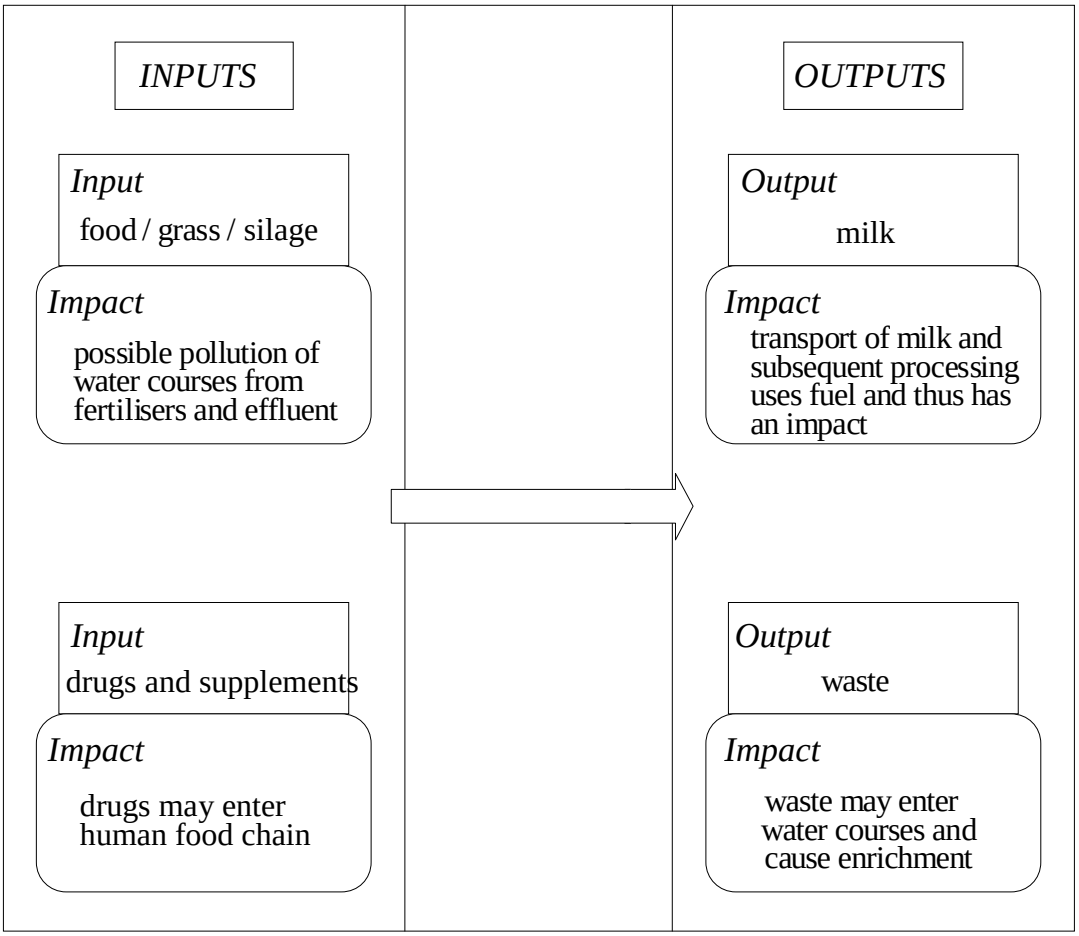
3. (a) (i) $900 - 6.6 = 893.4$ kcal lost;
$\frac{893.4}{900} \times 100$;
$= 99.3\%$ loss; (*accept 99%*) ***[2]***
*Award **[2]** for correct final answer.*

(ii) there is energy lost from respiration and waste production at each level within a food web;
crop production harvests food from lower down in the food web than harvesting fish from the top, therefore it is more efficient;
crops capture energy directly from primary source;
fish harvesting utilizes a resource that is several steps away from primary production; ***[2 max]***

(iii) heat;
respiration;
feces; ***[2 max]***

(b) (i) animals provide a source of protein (essential for the human diet);
animals convert vegetation to food that would not be available to humans directly;
produce diverse products (milk / meat / blood / wool);
taste and culture affect demand;
additional benefit that they are working animals; ***[3 max]***

(ii) *Award **[1]** for two inputs. Award **[1]** for each two associated impacts.*
Award ***[1]*** *for two outputs. Award **[1]** for each two associated impacts.*
e.g. for milk production



[4 max]

Accept any other reasonable answers.

4. (a) large animals require relatively large space for breeding/foraging/hunting/ territoriality;
the area often needs to, be large enough to limit disturbance / include buffer zones;
the area needs to be large enough to minimize the chance of animals wandering outside the reserve and becoming targets for hunters;
if reserves are too small, viable populations of large animals are not sustainable; ***[3 max]***

(b) conservation designed to conserve a particular species;
may not require the preservation of the animal's habitat;
or the animal in the wild;
usually associated with charismatic species, *e.g.* big cats, rhino; ***[2 max]***

(c) global volcanic eruption leading to rapid climate change/hostile environment;
catastrophic events such as meteorite impact leading to rapid climate change /hostile environment;
over hunting of large mammals by man (in the Holocene) to the extent that populations became reproductively unviable/wiped out; ***[2 max]***
Do not accept Ice Age.

(d) *collecting*: ***[2 max]***
using legislation to prevent moving/import of endangered species;
education about impact of collecting to change behaviour;
encouraging non-destructive "collection" *e.g.* photography rather than digging up;

overgrazing: ***[2 max]***
fencing/cordoning off sensitive habitats/biological hotspots;
reducing herd sizes;
providing alternative grazing;
supplementing income through nature tourism; ***[4 max]***
Accept other choices of threat and reasonable strategies.

5. (a) country A is an expanding population, whereas country B is a declining population;
country A has a high proportion of young people/wide base, whereas country B has a low proportion of young people/narrowing base;
country A has low proportion of elderly / narrow top whereas country B has a higher proportion of elderly people / wider top;
country A has a larger population than country B; ***[2 max]***

(b) (i) country A: footprint X;
country B: footprint Y; ***[1]***
*Both answers needed to receive **[1]**.*

(ii) country A is an LEDC and therefore, people use fewer resources/more local resources/generate less pollution, whereas country B is an MEDC and therefore, people use more resources/more imported goods/generate more pollution; ***[1 max]***

6. (a) water consumption has increased at a faster rate than population growth; ***[1]***
Figures are not needed.

(b) increased demand for domestic goods/luxury items *e.g.* washing machines/swimming pools;
increased economic development so more water used in industry;
agricultural development so greater use of water in irrigation (for intensive) farming;
cultural change towards greater personal hygiene; ***[2 max]***