

1. *max 1 mark from following:*

- 1 economic definition of sustainable; e.g. similar quantities of timber can be harvested year on year
- 2 grants for planting forests / management schemes;
- 3 planting to ensure sustainable harvest rate;

max 3 marks for planting strategy:

- 4 trees not planted too closely together;
- 5 support young trees to prevent damage e.g. from grazing animals;
- 6 species planted that are suitable for prevailing conditions / native spp;
- 7 softwood sp. / conifers / named conifer / fast growing sp. planted;
- 8 deciduous broadleaved species around edges for aesthetic reasons;
- 9 creates different habitats / named habitat / protected habitats/ some fallen trees left to rot;

max 3 marks for felling/cropping strategy:

- 10 ref. to clear felling having negative effects e.g. soil erosion;
- 11 only mature trees removed / selective felling / individual trees;
- 12 some clearings / rides / glades in woodland / strip felling;
- 13 control of, pests / diseases / fire prevention;
- 14 ref to coppicing / pollarding;
- 15 (deciduous trees) regrow from base/ idea of rotation/ cycle;
- 16 standards / large trees not coppiced, as encourages biodiversity;

7

[7]

2. (i) tree cut, close to ground/down to its stump/AW; **R** *down to trunk*
 new growth forms/AW;
 harvest after a number of years/process repeated;
 rotational coppicing/AW;
 ref to how coppicing increases biodiversity
 e.g. increasing light intensity;

max 3

- (ii) (standards) large planks/AW; **A** used as *timber*
A *standards* more valuable/AW
 (coppice) small diameter wood/fencing/hurdles/garden
 furniture/charcoal/firewood/matches;
 (coppice) continuous, source of timber/income;
 recreational use/nature reserve; **A** ref to tourism

max 2

[5]

3. routeways/pathways allowing movement of (insects);
 ref to connectivity/AW;
 ref to sites of refuge/habitat;

max 2

[2]

4. pest remains/not totally eradicated;

- slow to work/AW;
labour intensive/AW;
reintroduction often needed;
predator may eat crop;
risk of migration;
risk to other organisms/mutation/predation of other species; max 2 [2]
5. pollination;
maintain biodiversity;
benefits to food chain/food for other organisms; max 2 [2]
6. increased profit for farmers/shops;
no residues on food;
no pesticides;
less use of inorganic fertilizers;
less risk of pollution;
benefits to soils structure and quality;
benefits to biodiversity;
benefits to human health; max 3 [3]
7. 23 ;
6-7 ; [2]
8. preservation of, organisms / environments ;
that are at risk from human activity ;
requires management ;
creation of new habitats ;
may need reclamation ;
conservation requires vigilance ;
resolving conflicts ; A suitable alternatives 2 max [2]

9. (a) (i) curve to have peaks to right of lemming peaks and must have two peaks between 1994 and 1996 and 1998 and 2000 respectively ;
peaks below level of lemming peaks ; 2
- (ii) plenty / AW, of food ;
few / AW, predators ;
high population of alternative prey for predators ;
no overcrowding / lots of breeding sites / AW ;
less disease ;
less competition from other species ;
low environmental resistance ; 3 max
- (b) *interspecific*
between two (or more) species ;
two named species (on lemmings) ;
intraspecific
within species ;
named species plus resource ;
if definitions of interspecific and intraspecific competition are the wrong way around can still gain one mark for correct examples of both types of competition 3 max
- (c) maximum, size / number, of a, population / species ;
either
(supported) in a particular, habitat / ecosystem / area / environment ;
or
determined by limiting factors ; 2
- [10]**
10. (i) trees are living organisms;
renewable;
ref to, growth / growing;
timber is, of use to human beings / made into products; max 2
- (ii) harvested at levels which leave sufficient organisms;
to grow / reproduce, and replenish what has been harvested;
ref to, coppicing / replanting / afforestation;
can be carried on indefinitely; max 2
- [4]**

11. (a) cyclamen mite / prey populations increase;
 when conditions are suitable / when predator numbers are low / no or
 few limiting factors;
 provides plenty of food for predator mites;
 which begin to increase later / time lag;
 cyclamen mites are then eaten by (increasing numbers of) predators;
 so both decline in numbers;
 cycle repeated;
 prey populations reach higher levels than predators; max 4
- (b) (i) *start by looking at end of February*
 increases with appropriate time lag;
 decreases at spraying times (end of June / beginning of October);
 final peak for predator numbers is the lowest; max 2
- (ii) less food available / less strawberry plants;
 low temperature / frost;
 other predators;
 disease / parasites;
 ref to parasitoids;
 AVP;
R spraying idea max 2
- (c) (i) biological (pest control); 1
- (ii) insecticides, are harmful to other organisms / may kill natural
 predators to the pest;
 reduces species diversity / disrupts food chains;
 many insecticides are, slow to biodegrade / long lasting;
 concentrate along food chains / bioaccumulate / bioconcentrate;
 stored in fat deposits of organisms;
 ref to effects on top carnivores; e.g. egg shell thinning
 poisonous to those applying them; **A** ref to humans / asthma sufferers
 pests can build up a resistance;
 ref to selection;
 run-off from land carries them into water supplies / causes pollution /
 poisons aquatic organisms;
 problems of residues in food;
 AVP; e.g. pesticides need to be used repeatedly max 5
- (d) crop rotation;
 intercropping;
 release of, irradiated / sterile, males of pest species;
 AVP; e.g. fly paper max 2

12. (a) trees felled for wood to, sell / export;
cleared to provide land for agriculture; **A** cattle ranching
to build, housing / villages;
industrial development / mining / quarrying;
building of roads; max 3

- (b) **1** high, biodiversity / species diversity;
2 deforestation, causes extinction / reduces biodiversity;
3 decrease in, size of gene pool / genetic diversity;
4 act as carbon, reservoirs / sinks; **R** carbon fixation
5 remove carbon dioxide from atmosphere;
6 release of carbon dioxide when wood is burnt;
7 less photosynthesis also means less oxygen production;
8 transpiration contributes to atmospheric water content;
9 destruction of rainforests disrupts water cycle;
10 rainforests can be used to supply sustainable crops;
11 example of crop; e.g nuts / rubber / fruits / plant oils
12 drugs / other useful compounds (may await discovery), that only
occur in rainforests;
13 soils are nutrient deficient and cannot sustain agriculture;
14 increased risk of soil erosion;
15 moral responsibility to conserve for later generations;
16 ref to indigenous populations / tribes;
17 AVP; e.g. provision of habitats
ref to Fig. 1 max 8

QWC – clear, well organised using specialist terms; 1
award the QWC mark if four of the following are used in correct context

biodiversity	transpiration
deforestation	water cycle
carbon reservoirs / sinks	sustainable
photosynthesis	nutrient deficient

- (c) ban on import of wood from, tropical rain forests / unsustainable sources;
introduce labelling system for wood;
trade sanctions on countries that continue to remove rain forests;
schemes / financial support, for setting up of sustainable use of rain forests;
development of ecotourism;
educate local population as to importance of rain forests;
forest reserves established;
AVP;
AVP; e.g. debt relief
fair trade schemes
quotas max 3