GCSE Biology

Biodiversity

Mark Scheme

Time available: 60 minutes
Marks available: 55 marks

1. (a) (140 + 240 + 380 + 450 =) 1210

1

(b) the local people decided to farm cattle

1

a company starts growing plants for biofuels

1

(c) carbon dioxide

in this order only

1

photosynthesis

1

(d) animals and birds migrate because there is less food

1

more habitats are destroyed

1

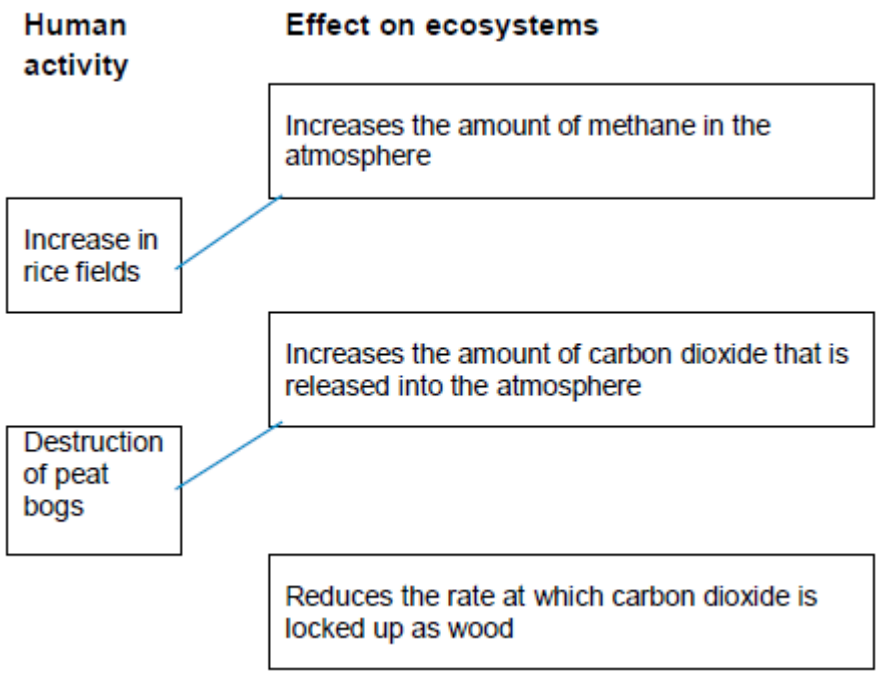
(e) any **one** from:

- breeding programmes (for endangered species)
- regeneration (programmes)
- reintroduction of field margins / hedgerows
- awareness raising with politicians / public
- recycling

1

[8]

2. (a)



extra lines from left cancels mark

2

(b) (i) any **two** from:

- (to provide land) for farming / agriculture
- (to provide land) for quarrying
- (to provide land) for building
- to provide wood for building materials
- to provide fuel
- to provide paper

2

(ii) any **two** from:

- changes in earth's climate, ie droughts, flooding, hurricanes
  ignore temperature rise
  allow ice caps melt
- rise in sea levels
- reduce biodiversity
- change in migration patterns
- may change distribution of species

*ignore acid rain **and** the ozone layer **and** forest fires*

2

[6]

3. (a) any **one** from:

- increased pollution
- dumping waste

allow described consequence e.g. vermin

accept (increased) landfill

accept (increased) fly tipping.

1

(b) (i) (mass of SO_2) decreases

1

and then levels off / plateaus

1

(ii) 2008

clear evidence of calculating 700 (000) = 1 mark

2

(iii) any **one** from:

- acid rain
- erosion of statues / buildings
- destruction of habitats
- reduction in biodiversity
- damage to lichen
- breathing problems

ignore reference to ozone layer

allow damage to plants.

1

(c) Carbon dioxide being absorbed in oceans and lakes 1

Photosynthesis by trees 1

[8]

4. (a) (i) correct bar heights

*three correct **2** marks*
*two correct **1** mark*
*one or none correct **0** marks*
ignore width

2

(ii) (Stream Y)

has many sludge worms / bloodworms

or

has no mayflies / caddis or few shrimp

*allow **1** mark if invertebrate not named but correct association given*

1

which indicate medium or high pollution

1

(b) (i) suspended solids increase (as a result of sewage overflow)

1

then decrease downstream / return to original levels

1

oxygen levels decrease (after sewage overflow)

1

and then rise again

1

(ii) any **three** from:

- mayflies decrease (to zero) near overflow
  accept 'have died out'
- because oxygen is low **or** mayflies have high oxygen demand
- mayflies repopulate / increase as oxygen increases again
- can't be sure if dissolved oxygen or suspended solids is the cause

3

(c) they respire / respiration

*aerobic respiration gains **2** marks*

1

this requires / uses up the oxygen

1

[13]

5. (a) decrease in photosynthesis (as fewer trees) causes less removal of CO_2

accept forest cleared for livestock which respire and give out CO_2

ignore 'Carbon sink'

1

burning / combustion releases CO_2

1

decay of wood (by microorganisms) releases CO_2

1

(b) any **two** from:

- loss of habitat / shelter
- loss of food source
- smaller populations more vulnerable / less likely to survive
- fewer plant species due to clearing

2

(c) (i) removing carbon dioxide from the air

1

(ii) any **one** from:

- growth of plants (to trap CO_2 in photosynthesis)

  allow afforestation
- CCS (carbon capture and storage)
- separate / store CO_2 from waste gases in industry
- make new peat bogs
- absorbed / dissolved in oceans / lakes / ponds
- used as calcium carbonate to form shells / bones

1

[7]

6. (a) (i) 76.0 / 76

correct answer with or without working gains 2 marks

allow 76.04 for 2 marks

allow 76.04 with extra decimal places eg 76.042 for 1 mark

$\frac{465}{611.5}$ *for 1 mark*

2

(ii) mass of fish declines (until 2008)

ignore use of numbers

allow number of fish decline (until 2008)

1

(due to an) increase in fishing / overfishing

1

and then rises (until 2010)

1

(which could be due to) quotas / net restrictions working

allow any reasonable suggestion, such as countries swapping quotas or restrictions on fishing during breeding seasons

ignore less fishing

*if no other marks awarded allow 1 mark for a decrease in mass **and** an increase in mass if answer relates to sustainable fishing*

1

(iii) (this is due to) public awareness / demand

allow legislation / rules

1

(b) fishing quotas / bans

1

(small) net / mesh size

if size of net is stated then it must be smaller

if size of mesh is stated then it must be larger

1

(c) (fish) cannot move freely / as much

1

(therefore) less <u>energy</u> loss from the fish

*do **not** allow 'no energy is lost'*

ignore references to less heat loss through controlling body temperature

ignore references to respiration

1

(there is) more food available / better quality food / fed more often

accept 'high-protein food (for making cells)'

1

(so) there is more energy for growth **or** (more food) is converted to biomass

1

[13]