**Q1.**The graph below shows the area of forest lost in Madagascar from 2009 to 2012.

(a)     The area of forest lost each year in Madagascar increased between 2009 and 2012.

Determine the total area of forest lost from the start of 2009 to the end of 2012.

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  Total area of forest lost = ...................... thousand hectares

**(1)**

(b)     What are the possible reasons for the change in the area of forest lost per year between 2009 and 2012?

|  |  |  |
| --- | --- | --- |
|   | Tick **two** boxes. |   |
|   | The local people stop growing rice |   |
|   | Fewer new houses are needed for the population |   |
|   | The local people decided to farm cattle |   |
|   | More trees have been planted |   |
|   | A company starts growing plants for biofuels |   |

**(2)**

(c)     More forest was lost in 2012 than in 2009.

Use words from the box to complete the sentences.

|  |  |  |  |
| --- | --- | --- | --- |
|   | **carbon dioxide** | **excretion** | **nitrogen** |
|   | **oxygen** | **photosynthesis** | **respiration** |

The increase in the area of forest lost has caused an increase in the gas

...........................................

The increase of this gas has been caused because less of the gas is being

absorbed by plants for the process of ........................................... .

**(2)**

(d)     Deforestation can have negative effects on our ecosystems.

What are the negative effects of deforestation?

|  |  |  |
| --- | --- | --- |
|   | Tick **two** boxes. |   |
|   | Animals and birds migrate because there is less food |   |
|   | More habitats are destroyed |   |
|   | There is less acid rain |   |
|   | There is more biodiversity |   |
|   | The global temperature decreases |   |

**(2)**

(e)     Scientists try to reduce the negative effects of human activity on our ecosystems.

One way is to protect rare habitats.

Give **one other** way of reducing the negative effects of human activity on our ecosystems.

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**(1)**

**(Total 8 marks)**

**Q2.**          The photograph shows an area where a tropical forest is being cleared.



(a)     Complete the sentences.

          People could use timber from the forest for .................................................................... .

          The cleared land can be used for ..................................................................................... .

          Clearing forests increases the concentration of ............................................................... in the atmosphere.

          This increase causes global .................................................................. .

**(4)**

(b)     Clearing forests causes some species to become *extinct*.

(i)      What is meant by *extinct*?

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**(1)**

(ii)     It is important to prevent species from becoming extinct.

         Give **one** reason why.

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**(1)**

**(Total 6 marks)**

**Q3.**Human activity affects ecosystems.

(a)     Draw **one** line from each human activity to the effect on ecosystems.

**(2)**

(b)     (i)      Deforestation also affects the atmosphere.

Give **two** reasons why deforestation takes place.

1 ................................................................................................................

...................................................................................................................

2 ................................................................................................................

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**(2)**

(ii)     Changes in the gases in our atmosphere can cause global warming.

Give **two** possible effects of a rise in the Earth’s temperature.

1 ................................................................................................................

...................................................................................................................

2 ................................................................................................................

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**(2)**

**(Total 6 marks)**

**Q4.**          Improving the quality of life for everyone without damaging the planet for the future is known as sustainable development.
One problem is the rapid growth in the Earth’s population of humans during the last 500 years. This is shown by the graph.



(a)     When the Earth’s population was much smaller, the effects of human activities on forests were usually small and local.
In the past 500 years there has been large-scale deforestation in some areas. Give **two** reasons for this.

1 ..................................................................................................................................

2 ..................................................................................................................................

**(2)**

(b)     Look at the bar chart. It shows the average amount of energy used by each person in one year in the USA, Japan and Bangladesh.



(i)      Suggest **one** reason why so much more energy is used per person in the USA than in Bangladesh.

...........................................................................................................................

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**(1)**

(ii)     Using a lot of resources for energy harms the Earth.
Explain why.

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**(2)**

(c)     As we are using more resources, waste management is becoming more important. In the UK much of the solid waste is still being dumped in landfill sites. In 1996, the UK government introduced a landfill tax because landfill sites were being used up. However, the year after the landfill tax was introduced it was estimated that 18 million tonnes of landfill waste was not reported. The government was trying to encourage other forms of waste management, such as:

•        reduce waste

•        reuse waste

•        recycle waste

(i)      Explain the main problem caused by the landfill tax.

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**(2)**

(ii)     Describe **one** example of how each of the different forms of waste management can be put into practice.

Reduce waste ....................................................................................................

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Reuse waste ......................................................................................................

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Recycle waste ...................................................................................................

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**(3)**

**(Total 10 marks)**

**Q5.**Human activities have many effects on our ecosystem.

The graph shows the volume of peat compost and peat-free compost used in gardening from 1999 to 2009.

(a)     Describe the trends shown in the graph.

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**(2)**

(b)     What effect does the destruction of peat bogs have on the gases in the atmosphere?

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**(1)**

(c)     Deforestation is also damaging ecosystems.

Describe **one** effect of deforestation on ecosystems.

**(1)**

**(Total 4 marks)**

**Q6.**In many areas of the world the mass of household waste produced each year is increasing.

(a)     Give **two** reasons why the mass of household waste is increasing each year.

1......................................................................................................................

........................................................................................................................

2......................................................................................................................

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**(2)**

(b)     The table below shows how the mass of household waste in the UK has changed from 2004 to 2012.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|   | **Year** | **Total mass ofhousehold waste inthousands of tonnes(including totalhousehold recycling)** | **Total mass ofhousehold recyclingin thousands oftonnes** | **Percentage ofhousehold wasterecycled** |
|   | **2004** | 25 658 | 5785 | 22.5 |
|   | **2006** | 25 775 | 7976 | 30.9 |
|   | **2008** | 24 334 | 9398 | 38.6 |
|   | **2010** | 23 454 | 9733 |  |
|   | **2012** | 22 643 | 9782 | 43.2 |

(i)      Calculate the percentage of household waste recycled in 2010.

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......................... %

**(2)**

(ii)     The UK government has been encouraging a ‘zero waste economy’.

In a ‘zero waste economy’, we reduce, reuse and recycle as much waste as possible.

A newspaper concluded that: **‘The government’s ‘zero waste economy’ has been successful.’**

Use information from the table to describe the reasons for and against the newspaper’s conclusion.

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**(4)**

(c)     (i)       Some waste releases carbon dioxide and methane into the atmosphere.

An increase in carbon dioxide and methane contributes to global warming.

Global warming can cause sea levels to rise.

Describe **two** other possible effects of global warming on our environment.

1.............................................................................................................

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2.............................................................................................................

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**(2)**

(ii)     Storing the carbon dioxide helps to prevent more global warming.
Carbon dioxide can be stored (sequestered) in trees when they photosynthesise.

Give **one** different way in which carbon dioxide is sequestered in our environment.

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**(1)**

**(Total 11 marks)**

**Q7.**          In South Asia, forests are being cleared to grow palm oil trees. The palm oil is mainly used to produce fuel for motor vehicles.

The graph shows the production of palm oil in one South Asian country.

(a)     Calculate the mean increase in palm oil production per year for the five year period 2000 to 2005.

Show clearly how you work out your answer.

........................................................................................................................

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          Mean increase = .............................. millions of tonnes per year

**(2)**

(b)     Clearing forests and replacing the forests with palm oil trees to produce fuel for motor vehicles will affect the composition of the atmosphere.

Explain how.

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**(5)**

**(Total 7 marks)**

**Q8.**          Scientists have discovered that curry spices affect sheep and cattle. Curry spices can reduce the amount of methane that grazing animals give off.

‘Bad’ bacteria in the animal’s stomach produce methane. About 12% of the animal’s food is changed into methane.

The curry spice coriander works like an antibiotic. Adding coriander to animal food reduces methane production by about 40%.

(a)      (i)     Why does adding coriander to an animal’s food reduce methane production?

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**(1)**

(ii)     Explain **one** advantage to a farmer of adding coriander to the animal’s food.

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**(2)**

(b)     Farm animals give off large amounts of methane.

Explain the effects of adding large amounts of methane to the atmosphere.

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**(3)**

**(Total 6 marks)**

**M1.**(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]**

**M2.**          (a)     fuel / houses / paper

*allow any object made from wood*

**1**

          farming / agriculture / replanting

*allow roads / homes / factories*

**1**

          carbon dioxide / greenhouse gas / pollution **or** relative named pollutant

**1**

          warming / temperature increase

**1**

(b)     (i)      none of species left / died out

**1**

(ii)     may have products useful to humans / examples

*allow preserve for future generations* ***or*** *‘still there to look at’*

*allow affect food chains / cycles* ***or****extinction of other species*

*allow non human reasons eg loss of habitat*

*ignore environmental effects*

**1**

**[6]**

**M3.**(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]**

**M4.**          (a)     any two from:

          agriculture

*accept land to grow crops* ***or*** *graze cattle*

          buildings

          roads

          any 2 different uses for wood for 1
mark each

*accept wood for burning (energy)
accept timber for wood*

**2**

(b)     (i)      (USA has) more wealth / technology /
devices / need for electricity

**1**

(ii)     damage done

*e.g. pollutant / mining / non-renewable / deforestation*

**1**

         linked effect

*e.g. greenhouse effect / visual pollution / run out of resources / flooding*

**1**

(c)     (i)      **Problem –** because some people did not want to pay the (landfill) tax

**1**

         Waste dumped elsewhere

**1**

(ii)     named example of

         **Reduce –** such as less packaging / repairing

**1**

         **Reuse –** such as glass bottles / shopping bags / ink jet cartridges

**1**

         **Recycle –** such as metals, glass, paper

*Mark as a whole*

**1**

**[10]**

**M5.**(a)     any **two** from:

•        (volume of) peat compost has been steady and then declined **or** volume of peat compost has declined since 2005

*allow 2007 instead of 2005*

•        (volume of) peat-free compost has increased (since 1999)

•        (volume of) peat is higher than peat-free until 2005, then peat-free compost is higher (than peat)

*allow 2007*

•        total volume of peat and peat-free compost has increased.

**2**

(b)     increases carbon dioxide (in the atmosphere)

*ignore methane*

**1**

(c)     any **one** from:

•        reduces biodiversity

•        destruction of habitats

•        disruption of food chains.

**1**

**[4]**

**M6.**(a)     (rapid) growth in population (size)

**1**

increase in the standard of living

*accept description of increased standard of living, eg more packaging, more food thrown away or overbuying resources*

**1**

(b)     (i)      41.5

*allow 1 mark for 9733 ÷ 23454*

***or***

*allow 1 mark for 0.415*

***or***

*allow 1 mark for 41.49* ***or*** *41* ***or*** *41.4*

**2**

(ii)     any **four** from

arguments for:

•        there has been a reduction in total waste

•        there has been an increase in (total mass of) recycling

•        there has been an increase in the percentage of waste recycled

•        it (may) not be possible to achieve zero waste.

arguments against:

•        there is still a lot of waste (not recycled)

•        there has only been a small reduction in total waste

•        there was one year (2006) where total waste went up

•        the rate of increase of percentage recycled is slowing down

•        no information on materials reused

•        no information on waste from factories / industry

*max 3 marks for a one sided argument*

*allow as reason against if clear*

*allow still more than half or 56.8% of waste (not recycled).*

**4**

(c)     (i)      any **two** from:

•        reduce biodiversity **or** extinction

•        change in migration patterns

•        change in species distribution

•        change in climate

*ignore rise in sea levels*

*ignore temperature change*

*accept correct examples of climate change e.g. storms, flooding, drought*

*references to weather changing is insufficient*

*allow ice caps melting or habitat destruction.*

**2**

(ii)     any **one** from:

•        absorbed by oceans / ponds / lakes

•        peat bogs

*allow used for skeletons / shells of sea creatures*

*allow in fossil fuels / limestone.*

**1**

**[11]**

**M7.**          (a)     860

*correct answer gains* ***2*** *marks*

*if answer incorrect evidence of (6100 - 1800) ÷ 5*

***or*** *4300 ÷ 5*

***or*** *(900 + 600 + 1000 + 700 + 1100) ÷ 5 gains* ***1*** *mark*

*allow ecf from 1 incorrect graph reading*

**2**

(b)     *ignore references to oxygen / sulfur dioxide / nitrogen oxides / acid rain                  ignore global warming*

**Effects of deforestation**

deforestation increases the amount of carbon dioxide in the atmosphere

*award this point only if linked to deforestation*

**1**

any **two** from:

•        due to less photosynthesis **or** less carbon dioxide taken in
**or** carbon dioxide not locked up in (forest) trees

•        due to burning of forest / from machinery

•        due to activity of microorganisms / decay

**2**

**Effects of growing palm for fuel**

carbon dioxide released when palm oil used as fuel

**1**

(eventually) CO2 intake and output might balance out **or** burning palm
oil carbon neutral

*accept less carbon dioxide than from burning fossil fuels*

**1**

**[7]**

**M8.**         (a)      (i)     kills / gets rid of / reduces methane bacteria

*allow kills / gets rid of / reduces bad bacteria*

*ignore acts like antibiotic*

**1**

(ii)     less food converted to methane

*allow can keep more cattle without further environmental damage*

*ignore energy*

**1**

more growth / meat / muscle / milk produced / more profit / fatter animals

*ignore references to bacteria and disease*

**1**

(b)     absorbs energy / heat radiated by Earth

*allow absorbs / traps energy / heat / from Earth*

*do* ***not*** *allow absorbs energy / heat from Sun*

**1**

some energy / heat reradiated

*ignore reflected*

*do* ***not*** *allow reradiates energy / heat from Sun*

**1**

leading to global warming / enhanced greenhouse effect

*accept effects of global warming eg melting ice caps*

*accept methane is a greenhouse gas*

*ignore references to ozone*

**1**

**[6]**