

SECTION A

Answer ALL FOUR questions.

1. (a) Light energy is converted to another type of energy when green plants make food.

- (i) What kind of energy is stored in this food?

Chemical energy is stored in this food.  
(1 mark)

- (ii) What substance is combined with carbon dioxide during photosynthesis?

Hydrogen in water combines with carbon dioxide during photosynthesis  
(1 mark)

- (b) Describe how plants and animals may become fossil fuels.

Plants and animals become fossil fuels by fossilization. The dead plants and animals become buried under wood, peat or soil. Over long periods, extreme temperature and pressure builds up and changes these plants and animals in fossil fuels.  
(2 marks)

- (c) Country X is a flat, tropical island. The electricity generating company in Country X uses a petroleum-based fuel. Name TWO alternative sources of energy that can be used for electricity generation in this country.

(i) Solar Energy  
(1 mark)

(ii) Wind Energy.  
(1 mark)

- (d) For EACH alternative source named in (c) above, give ONE disadvantage which may cause the electricity generating company to resist using the alternative source of energy identified.

(i) Solar Energy: energy systems may be too expensive to set up and maintain.  
(1 mark)

(ii) The wind may not be constantly blowing to ensure a constant supply of electricity  
(1 mark)

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M

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- (e) Recently, many used (pre-owned) vehicles have been imported from Japan and the United States into the Caribbean. This has resulted in an increase in the number of vehicles on the roads and increased amounts of carbon dioxide in the air.

- (i) Name TWO other pollutants which are being added to the atmosphere because of the increase in the number of vehicles.

Two other pollutants includes carbon monoxide and sulphur dioxide.

(2 marks)

- (ii) State ONE negative effect of ONE of the pollutants named in (e) (i) above, on the environment.

Sulphur dioxide ~~do~~ can cause reducing mgs to develop over areas.

(1 mark)

- (iii) Suggest TWO negative effects of increased levels of carbon dioxide on the Caribbean environment.

(1) The temperature in the Caribbean will increase due to the increased level of this greenhouse gas;  
(2) More natural disasters will be prevalent in the Caribbean due to the increased temperature.

(2 marks)

- (iv) What are TWO possible effects of increased levels of air pollution on the health of Caribbean people?

(1) More persons will develop lung cancer in the Caribbean.

(2) Breathing will become difficult due to damaged cilia, emphysema, bronchitis or asthma developing; which were caused by the pollutants. (2 marks)

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M

- (f) There have been serious concerns about the build-up of carbon dioxide in the atmosphere in recent years. Table 1 provides data about carbon dioxide emissions by China and the United States.

**TABLE 1: AMOUNT OF CARBON DIOXIDE EMITTED BY CHINA AND THE UNITED STATES FROM 1968 TO 2008**

	Carbon Dioxide Emission (in billion tonnes) by Year								
	1968	1973	1978	1983	1988	1993	1998	2003	2008
China	0.7	1.1	1.5	1.6	2.4	2.9	3.3	4.3	6.9
USA	4.3	5.2	5.3	4.8	5.4	5.7	6.2	6.4	6.4

(Data modified from BP p.l.c.)

- (i) Figure 1 on page 5 shows the data for USA. On the **same** grid, using the scales provided, plot a graph to represent the data for China. (5 marks)
- (ii) Label the axes on the graph. (1 mark)
- (iii) State an appropriate title for the graph. (1 mark)

Frequency Polygon showing the amount of carbon dioxide emitted by china and united states from 1968 To 2008 (1 mark)

- (iv) During which period was there a DECREASE in the amount of carbon dioxide emitted by the USA?

From 1976 to 1983 there was a decrease in the amount of carbon dioxide emitted by the USA. (1 mark)

- (v) In which year did China emit the same amount of carbon dioxide as the United States?

In 2007, China emit the same amount of carbon dioxide as the united states. (1 mark)

- (vi) Based on the trends in the graphs, which country would produce more carbon dioxide in 2010?

China will produce more carbon dioxide in 2010. (1 mark)

**Total 25 marks**

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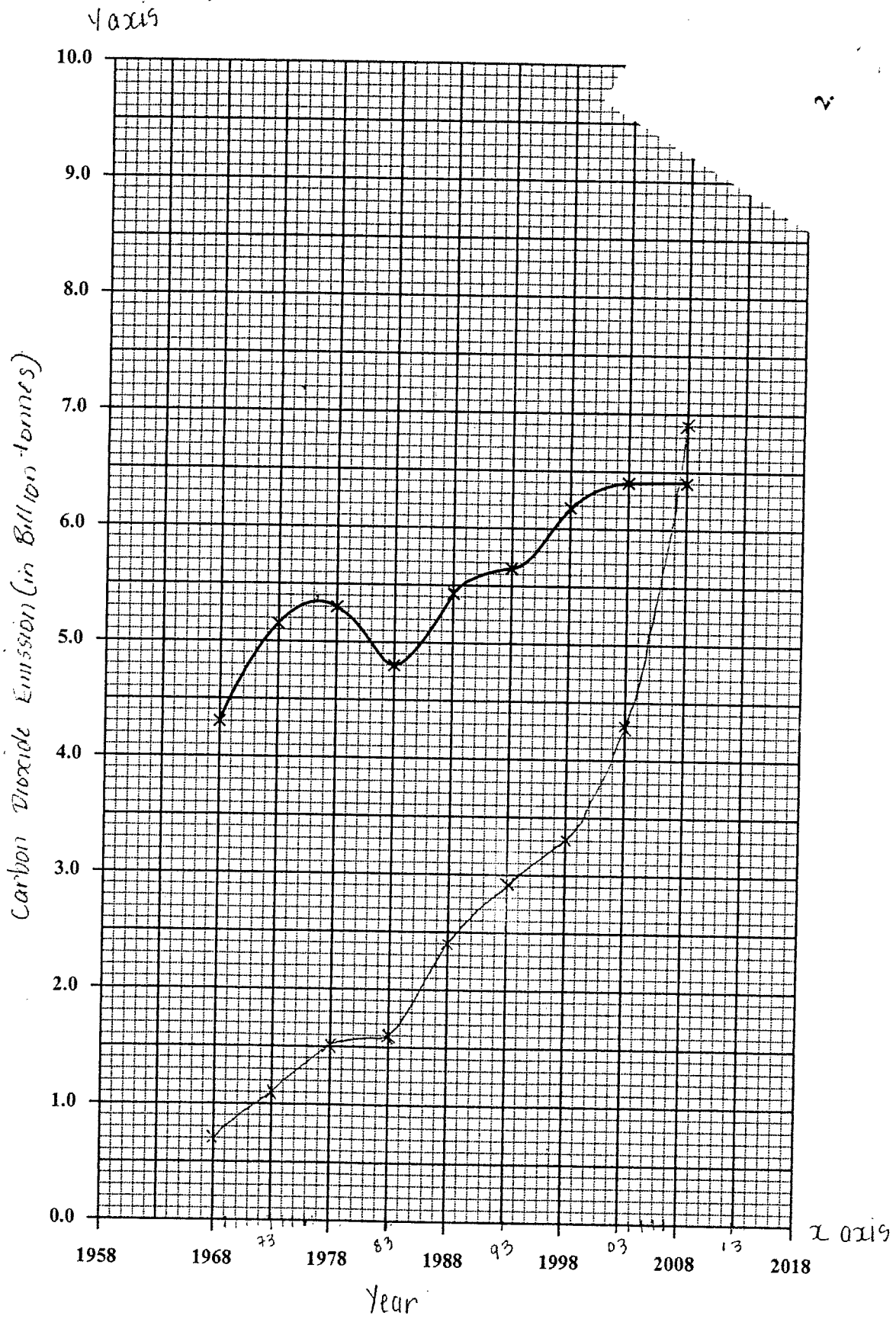


Figure 1. Carbon dioxide emission

CSEC Integrated Science  
Question 1  
Exemplar 2

SECTION A

Answer ALL FOUR questions.

1. (a) Light energy is converted to another type of energy when green plants make food.

- (i) What kind of energy is stored in this food?

Chemical energy is stored in this food.

(1 mark)

- (ii) What substance is combined with carbon dioxide during photosynthesis?

Water is combined with it.

(1 mark)

- (b) Describe how plants and animals may become fossil fuels.

When plants and animals die and they are not completely decomposed their remains may become buried in soil. As large amounts of pressure and heat are applied on the remains for many years, fossil fuels are formed.

(2 marks)

- (c) Country X is a flat, tropical island. The electricity generating company in Country X uses a petroleum-based fuel. Name TWO alternative sources of energy that can be used for electricity generation in this country.

- (i) Solar energy

(1 mark)

- (ii) Wind energy

(1 mark)

- (d) For EACH alternative source named in (c) above, give ONE disadvantage which may cause the electricity generating company to resist using the alternative source of energy identified.

- (i) The disadvantage of using solar energy is that solar energy is not present at the time such as during the night, energy cannot be captured at night.

(1 mark)

- (ii) The disadvantage of wind energy is that there isn't always a consistent supply of strong wind since the weather conditions may vary.

(1 mark)

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- (e) Recently, many used (pre-owned) vehicles have been imported from Japan and the United States into the Caribbean. This has resulted in an increase in the number of vehicles on the roads and increased amounts of carbon dioxide in the air.

- (i) Name TWO other pollutants which are being added to the atmosphere because of the increase in the number of vehicles.

Two other pollutants are sulphur dioxide and smoke.

(2 marks)

- (ii) State ONE negative effect of ONE of the pollutants named in (e) (i) above, on the environment.

One negative effect of sulphur dioxide is that it may dissolve in water to form acid rain which has hazards to the environment.

(1 mark)

- (iii) Suggest TWO negative effects of increased levels of carbon dioxide on the Caribbean environment.

Two negative effects are that the carbon dioxide can cause a greenhouse effect and thus create an unfavourable increase in the temperature and also carbon dioxide can <sup>dissolve</sup> ~~dissolve~~ in the <sup>sea</sup> water to form carbonic acid, which has a negative effect on coral reef.

(2 marks)

- (iv) What are TWO possible effects of increased levels of air pollution on the health of Caribbean people?

Two <sup>possible</sup> ~~poll~~ effects are: (1) Lung cancer can be formed from inhaling polluted air and (2) pollutants in the air such as smoke could lead to the inflammation of the eye.

(2 marks)

- (f) There have been serious concerns about the build-up of carbon dioxide in the atmosphere in recent years. Table 1 provides data about carbon dioxide emissions by China and the United States.

**TABLE 1: AMOUNT OF CARBON DIOXIDE EMITTED BY CHINA AND THE UNITED STATES FROM 1968 TO 2008**

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(Data modified from BP p.l.c.)

- (i) Figure 1 on page 5 shows the data for USA. On the **same** grid, using the scales provided, plot a graph to represent the data for China. (5 marks)
- (ii) Label the axes on the graph. (1 mark)
- (iii) State an appropriate title for the graph.  
Graph showing carbon dioxide emitted by China and USA from 1968 to 2008. (1 mark)
- (iv) During which period was there a DECREASE in the amount of carbon dioxide emitted by the USA?  
During the period of 1978 to 1983. (1 mark)
- (v) In which year did China emit the same amount of carbon dioxide as the United States?  
In 2007 (1 mark)
- (vi) Based on the trends in the graphs, which country would produce more carbon dioxide in 2010?  
China will produce more carbon dioxide in ~~2008~~ 2010. (1 mark)

**Total 25 marks**

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2000 registered 10 units of CO<sub>2</sub> emission  
2000 is the best result in the year

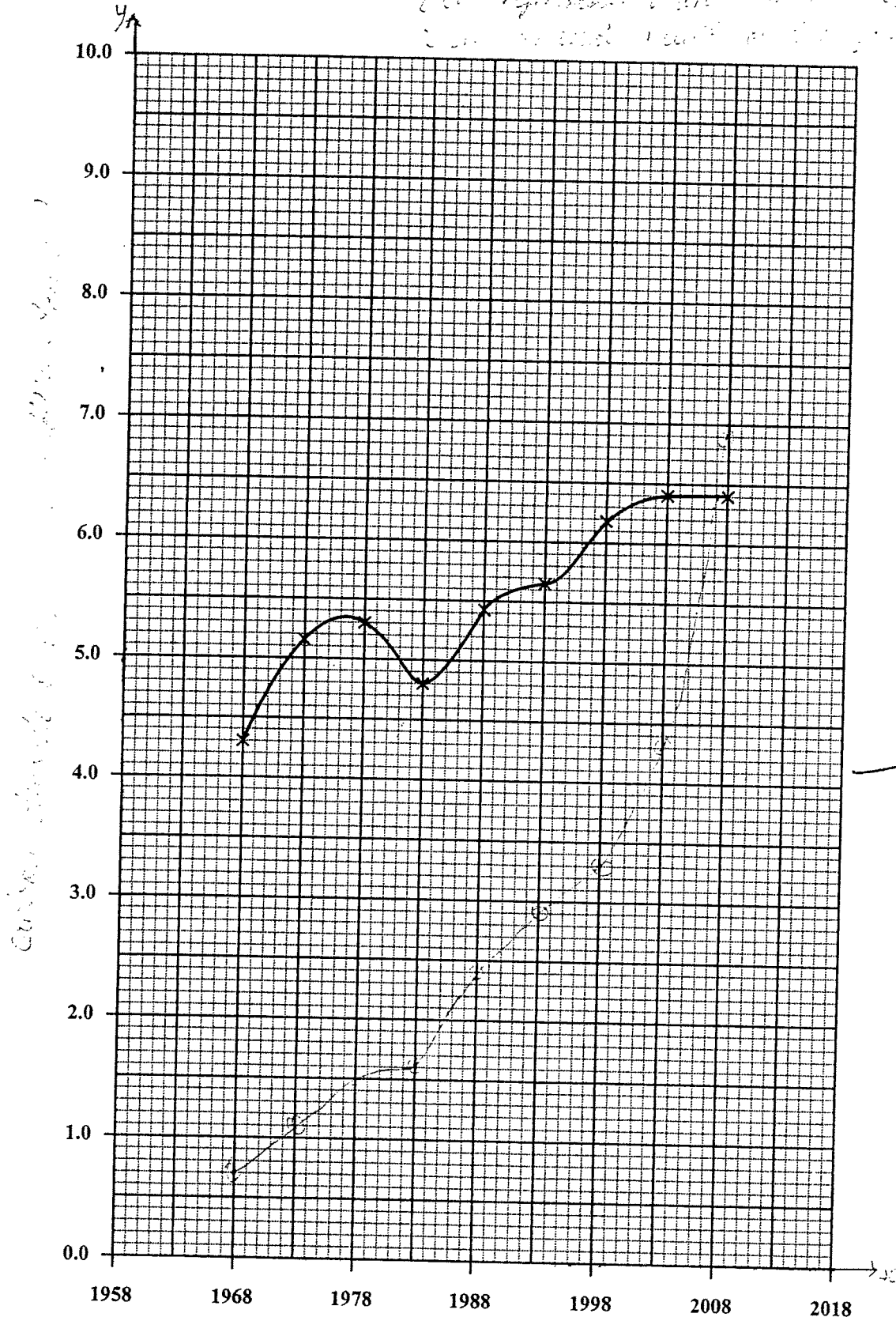


Figure 1. Carbon dioxide emission

64 Exemplar 3

A-

CSEC Integrated Sci<sup>12</sup>  
Qu (1) Question 1  
Exemplar 3

SECTION A

Answer ALL FOUR questions.

1. (a) Light energy is converted to another type of energy when green plants make food.

- (i) What kind of energy is stored in this food?

Chemical energy (1 mark)

- (ii) What substance is combined with carbon dioxide during photosynthesis?

Water (1 mark)

- (b) Describe how plants and animals may become fossil fuels.

When plants and animals die, their body or  
structure becomes buried under the land.  
By forces of compression, their bodies turn  
into fossil fuels. (2 marks)

- (c) Country X is a flat, tropical island. The electricity generating company in Country X uses a petroleum-based fuel. Name TWO alternative sources of energy that can be used for electricity generation in this country.

(i) Solar energy (1 mark)

(ii) Wind energy (1 mark)

- (d) For EACH alternative source named in (c) above, give ONE disadvantage which may cause the electricity generating company to resist using the alternative source of energy identified.

(i) Due to changes in weather and climate,  
the sun may not be readily available. (1 mark)

(ii) Due to changes in weather patterns,  
wind may not be a steady source (1 mark)

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(e) Recently, many used (pre-owned) vehicles have been imported from Japan and the United States into the Caribbean. This has resulted in an increase in the number of vehicles on the roads and increased amounts of carbon dioxide in the air.

(i) Name TWO other pollutants which are being added to the atmosphere because of the increase in the number of vehicles.

1) Sulphur dioxide  
2) Nitrogen dioxide (2 marks)

(ii) State ONE negative effect of ONE of the pollutants named in (e) (i) above, on the environment.

When sulphur dioxide reacts with water in the air, it combines to form acid rain and this causes destruction to flora and fauna. (1 mark)

(iii) Suggest TWO negative effects of increased levels of carbon dioxide on the Caribbean environment.

1) With increased carbon dioxide, more heat will be trapped from the sun and make conditions unbearable.  
2) With the increased heat, polar ice caps and glaciers melt and so causes a rise in the sea level thus resulting in flooding and sinking of low lying areas. (2 marks)

(iv) What are TWO possible effects of increased levels of air pollution on the health of Caribbean people?

1) Respiratory illnesses.  
2) Increased diseases and cancer problems to Caribbean people. (2 marks)

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- (f) There have been serious concerns about the build-up of carbon dioxide in the atmosphere in recent years. Table 1 provides data about carbon dioxide emissions by China and the United States.

**TABLE 1: AMOUNT OF CARBON DIOXIDE EMITTED BY CHINA  
AND THE UNITED STATES FROM 1968 TO 2008**

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(Data modified from BP p.l.c.)

- (i) Figure 1 on page 5 shows the data for USA. On the same grid, using the scales provided, plot a graph to represent the data for China. (5 marks)
- (ii) Label the axes on the graph. (1 mark)
- (iii) State an appropriate title for the graph.

A graph showing amount of Carbon Dioxide emitted by China and United States from 1968 to 2008 (1 mark)

- (iv) During which period was there a DECREASE in the amount of carbon dioxide emitted by the USA?

1978 - 1983

(1 mark)

- (v) In which year did China emit the same amount of carbon dioxide as the United States?

2007

(1 mark)

- (vi) Based on the trends in the graphs, which country would produce more carbon dioxide in 2010?

China

(1 mark)

**Total 25 marks**

15-

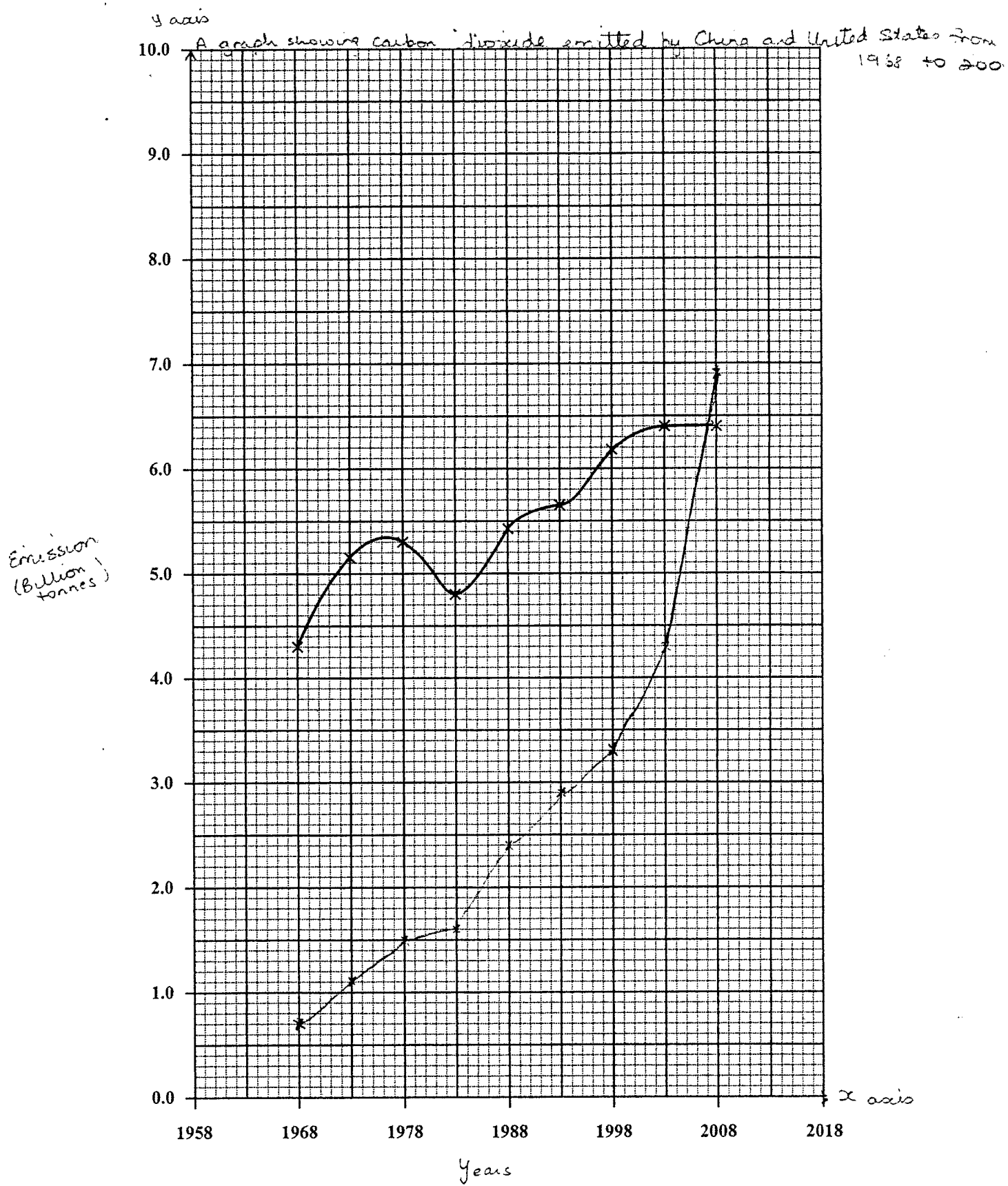


Figure 1. Carbon dioxide emission

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**Integrated Science**  
**Paper 02 – June 2011**

**Comments**

Question 1: Exemplar 1, 2 and 3

- Part (a)      These candidates were awarded full marks for this part of the question because the candidates clearly stated the type of energy present as required in (i) and correctly named the substance which combines with carbon dioxide during photosynthesis.
- Part (b)      These candidates were awarded full marks for this part of the question because the candidates were able to use appropriate scientific terminology and to provide adequate detail to completely answer the question. In addition, the responses were clear.
- Part (c)      These candidates were awarded full marks for this part because the candidates correctly named the alternative sources of energy.
- Part (d)      These candidates were awarded full marks for this part because the candidates were able to clearly state appropriate disadvantages of the named alternative sources of energy.
- Part (e)      These candidates were awarded full marks for this part because the candidates had a comprehensive grasp of pollution, pollutants and their negative impact as required by the syllabus.
- Part (f)      These candidates were awarded full marks for this part as the candidates clearly demonstrated the ability to construct, label and analyze graphs. For sections (i) to (iii) the points were plotted correctly and smooth lines drawn through them, the axes were labelled correctly and an appropriate title stated; for sections (iv) to (vi), the candidates were able to correctly extract information from the graph.