



Province of the  
**EASTERN CAPE**  
EDUCATION

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 11**

**NOVEMBER 2014**

**LIFE SCIENCES P2**

**MARKS:** 150

**TIME:** 2½ hours



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This question paper consists of 14 pages.

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**INSTRUCTIONS AND INFORMATION**

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in your ANSWER BOOK.
3. Start EACH question on a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. If answers are NOT presented according to the instructions of each question, then candidates will lose marks.
6. All drawings should be done in pencil and labelled in blue or black ink.
7. Draw diagrams and flow charts ONLY when requested to do so.
8. The diagrams in this question paper may NOT necessarily be drawn to scale.
9. The use of graph paper is NOT permitted.
10. You may use a non-programmable calculator, protractor, and compass.
11. Write neatly and legibly.

**SECTION A****QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A–D) next to the question number (1.1.1–1.1.10) in the ANSWER BOOK, for example 1.1.11 D.

1.1.1 Name the microorganism that is not classified in a kingdom.

- A Virus
- B Fungus
- C Bacterium
- D Protozoa

1.1.2 The short-lived immunity that mothers pass to their babies is called ...immunity.

- A passive
- B maternal
- C innate
- D active

1.1.3 Using natural resources so that they are not depleted.

- A Conservation
- B Sustainable use
- C Poaching
- D Deforestation

1.1.4 Which of the following is present in the Bryophytes?

- A Seeds
- B Xylem
- C Spores
- D Flowers

1.1.5 Which of the following is NOT a feature of wind-pollinated flowers?

- A Petals are large and brightly coloured.
- B Large anthers with long filaments.
- C Small, light and smooth pollen.
- D Stigmas are large and feathery.

1.1.6 The carpel (pistil) of a flower consists of the ...

- A anther, style and ovary.
- B stigma, filament and ovary.
- C anther, filament and ovary.
- D stigma, style and ovary.

1.1.7 Fertilisation in Angiosperms occurs when ...

- A the pollen tube grows down the style.
- B pollen moves from the anther to the stigma.
- C a sperm unites with an egg cell.
- D the ovary enlarges into a fruit.

1.1.8 Vertebrates exhibit the following features except ...

- A an endoskeleton of cartilage and/or bone.
- B a brain enclosed in a protective case called the cranium.
- C two pairs of appendages attached to girdles.
- D a notochord in the adult form.

1.1.9 Which two of these gases is the main cause of global warming?

- A CFCs and carbon dioxide
- B Carbon dioxide and sulphur dioxide
- C Nitrous oxide and carbon dioxide
- D Carbon dioxide and methane

1.1.10 Which of the following is not a toxic heavy metal?

- A Lead
- B Methane
- C Cadmium
- D Mercury

(10 x 2) (20)

1.2 Give the correct biological term for each of the following descriptions. Write only the term next to the question number (1.2.1–1.2.10) in the ANSWER BOOK.

1.2.1 An organism without a true nucleus

1.2.2 The type of alimentary canal which stretches from the mouth to the anus

1.2.3 A group of plants that have seeds enclosed in an ovary

1.2.4 Substances used to stimulate the production of antibodies and provide immunity against one or several diseases

1.2.5 A process in biotechnology that is used to convert sugar into alcohol and CO<sub>2</sub>

1.2.6 The increase in the concentration of nutrients in an aquatic ecosystem, which leads to an increase in primary producers such as algae

1.2.7 A fluid-filled cavity lined with mesoderm

- 1.2.8 The group of organisms such as bacteria and fungi that recycle nutrients in dead plants and animals
- 1.2.9 Cultivation of plant populations of a single species
- 1.2.10 The control of alien invaders by using their natural enemies from their native country

(10)

- 1.3 Indicate whether each of the statements in COLUMN I, applies to A **only**, B **only**, **both A and B**, or **none** of the items in COLUMN II. Write A **only**, B **only**, **both A and B**, or **none** next to the question number (1.3.1–1.3.10) in the ANSWER BOOK.

	COLUMN I	COLUMN II	
1.3.1	Requires water to undergo sexual reproduction	A	Angiosperms
		B	Pteridophytes
1.3.2	Formation of seeds	A	Angiosperms
		B	Gymnosperms
1.3.3	White blood cells that produce antibodies in response to pathogens	A	Phagocytes
		B	Lymphocytes
1.3.4	Cephalisation is found in ...	A	Platyhelminthes
		B	Chordata
1.3.5	The process of inserting foreign genes into an organism	A	Genetic engineering
		B	Genetic modification
1.3.6	The part that is formed from a fertilised ovule	A	Seed
		B	Fruit
1.3.7	Yeast is a unicellular fungus used in traditional technology to make ...	A	Cheese
		B	Yogurt
1.3.8	A natural resource that cannot be replaced by natural means	A.	Non-renewable
		B	Conserved
1.3.9	When biological productivity is reduced and conditions become desert-like	A	Desertification
		B	Deforestation
1.3.10	The plant(s) where the gametophyte is dominant	A	Fern
		B	Gymnosperm

(10 x 2) (20)

**TOTAL SECTION A: 50**

**SECTION B****QUESTION 2**

- 2.1 The table below shows the number of cases of tuberculosis (TB) and the number of deaths from TB around the world in 2009. Study the table and answer the questions that follow.

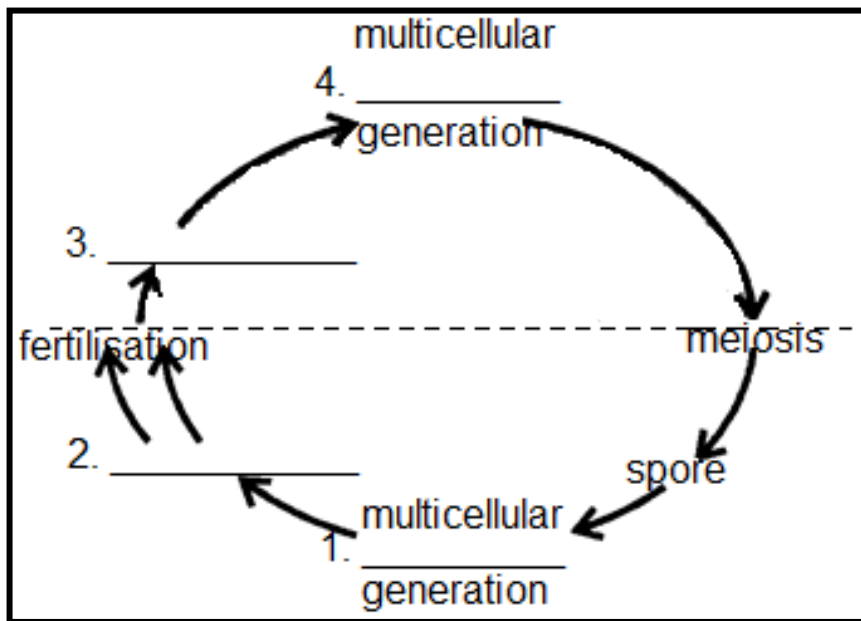
<b>Region</b>	<b>Number of cases</b>	<b>Number of deaths</b>
Africa	3 900	430
America	350	20
Europe	560	62
South-East Asia	4 900	480
Western Pacific	2 900	240
Eastern Mediterranean	1 000	99
<b>Global Total</b>	<b>14 000</b>	<b>1 300</b>

- 2.1.1 Draw a bar graph using the data for each region in the table to show the number of deaths from TB in 2009. (6)
- 2.1.2 Calculate the percentage of cases in the Eastern Mediterranean. (2)
- 2.1.3 Why do you think that Europe and America have such a small number of cases of TB compared to the other countries in the table? Give ONE reason. (2)

2.2 A type of bacterium called *Escherichia coli* (*E.coli*) normally lives in the large intestine of humans. To determine whether *E.coli* is present in water, a chemical indicator is used. If the chemical indicator changes from a clear red colour to a cloudy yellow colour, this indicates that *E.coli* is present. In an investigation conducted by a group of grade 11 learners, samples taken from three rivers (X, Y, and Z) were investigated for the presence of *E.coli*. Samples were taken from each river and put into glass bottles, which contained the clear red indicator solution. The bottles were then incubated at 37 °C for two days. Only river Y showed presence of *E.coli*.

- 2.2.1 Explain TWO safety precautions that the learners should take when conducting this investigation. (2 x 2) (4)
- 2.2.2 Suggest ONE reason for incubating the sample at 37 °C. (2)
- 2.2.3 Explain how *E. coli* could have got into river Y. (2)

2.3 Study the diagram, which shows alternation of generations and answer the questions that follow.



- 2.3.1 Complete the missing terms on the diagram. (4)
- 2.3.2 Which process in plant cells will:
  - (a) increase and (1)
  - (b) decrease the chromosome number? (1)
- 2.3.3 Name the structure represented by number 1 in:
  - (a) mosses and (1)
  - (b) ferns respectively. (1)

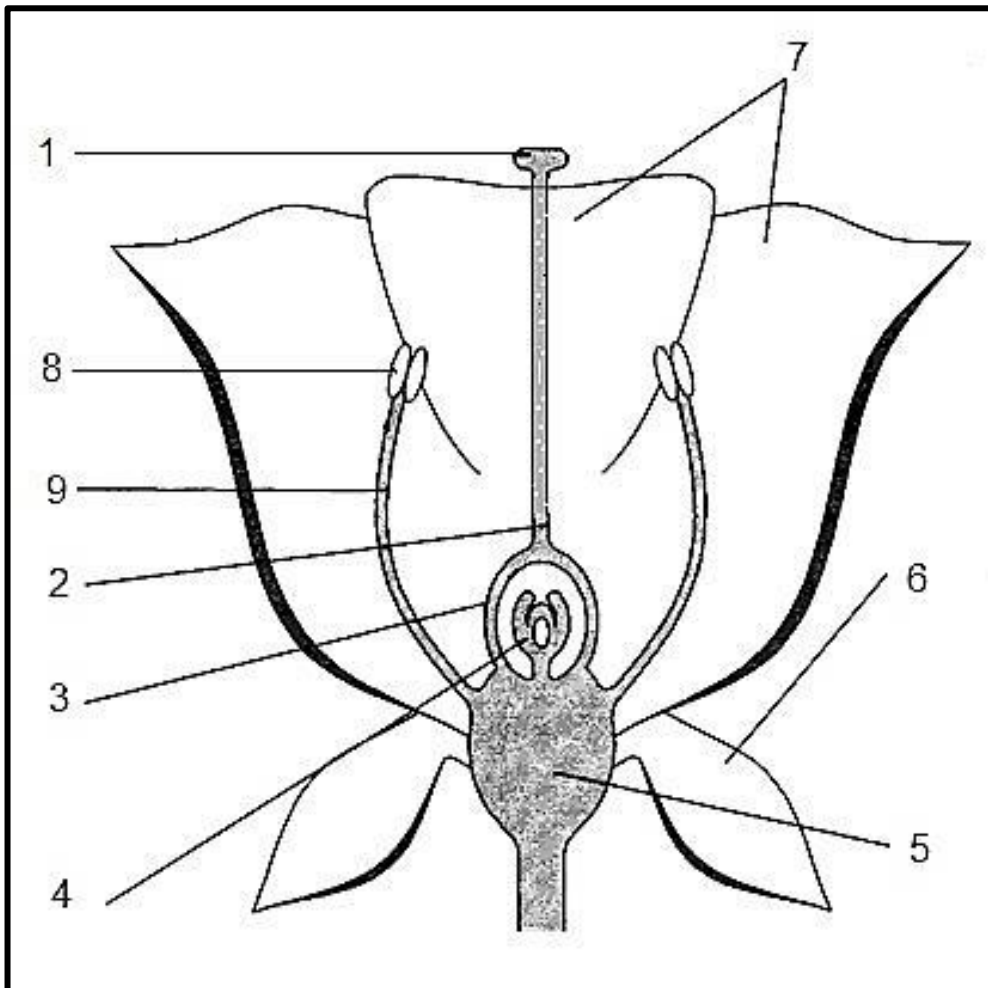
2.4 Answer the following questions on Annelida.

2.4.1 Between which two phyla on the evolutionary line would you find the Annelida? (2)

2.4.2 What is the significance of the coelom? (1)

2.4.3 What type of symmetry is found in Annelids? (1)

2.5 Study the diagram of a flower of an Angiosperm and answer the questions that follow.



2.5.1 Write down the number of the part where the female gametes would be produced. (1)

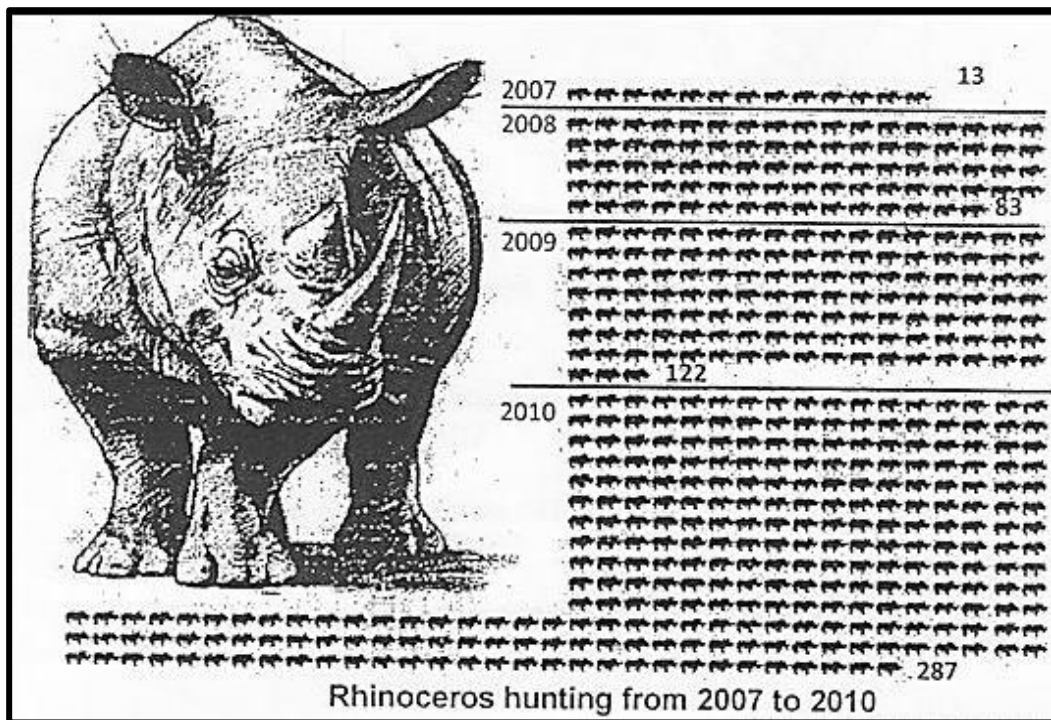
2.5.2 Which number represents the whorl that is important for insect pollination? (1)

2.5.3 On this flower, both male and female organs mature at the same time. Mention ONE obvious feature that can prevent self-pollination. (1)

2.5.4 State ONE way in which the Angiosperm is better adapted to a terrestrial life than the Bryophytes. (2)



2.6 Study the following diagram and answer the questions that follow.



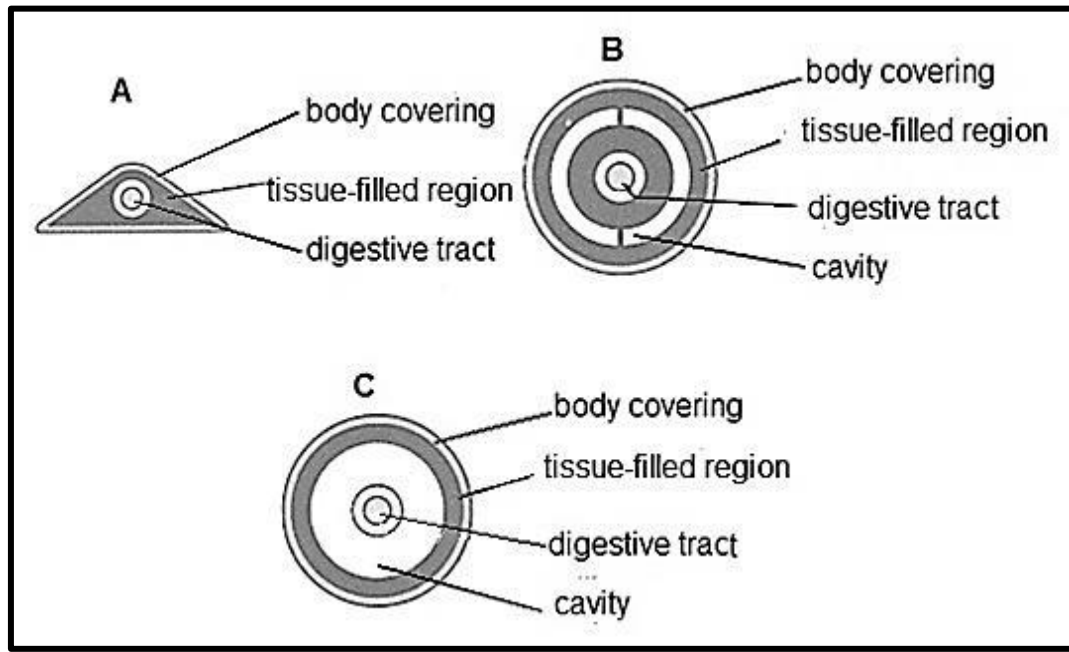
[Source: Adapted from *Volksblad*, 27 November 2010]

- 2.6.1 Formulate a hypothesis that will be accepted for the above data. (3)
- 2.6.2 List the dependant variable. (1)
- 2.6.3 List the independent variable. (1)

[40]

## QUESTION 3

3.1 The diagrams below show the body plans of three types of animals. Study the diagrams and answer the questions that follow.



3.1.1 Write only the letter(s) of the diagram(s) that represents the following:

- (a) Pseudo-coelomate
- (b) Acoelomate
- (c) Triploblastic
- (d) Chordate

(5)

3.1.2 Mention ONE advantage and ONE disadvantage of an exoskeleton in arthropods.

(2)

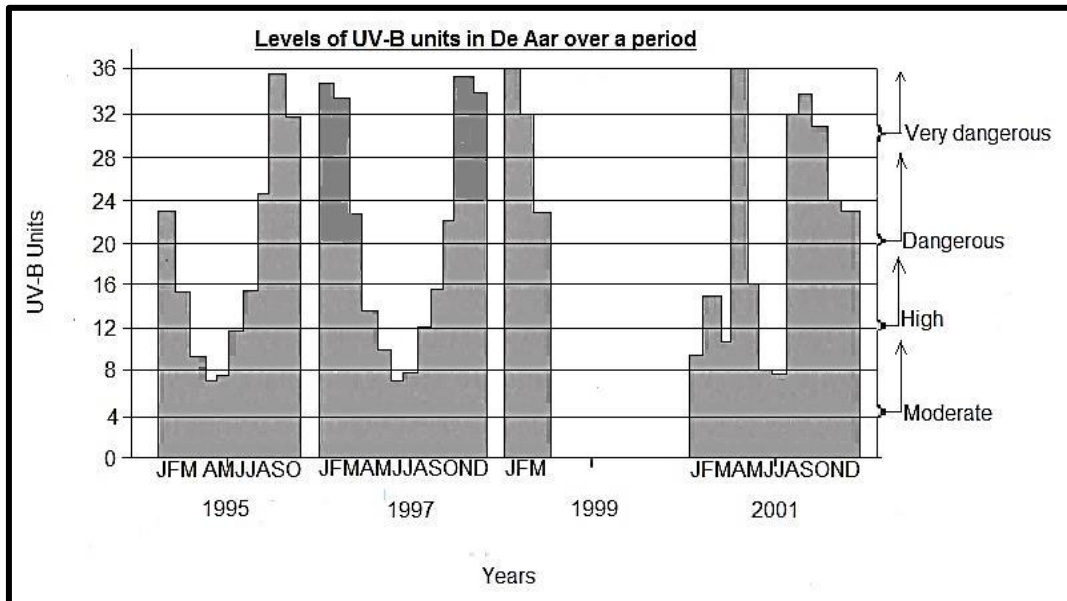
3.1.3 Describe ONE advantage of a through gut in the Annelida.

(2)

3.1.4 From which embryonic layer does the tissue-filled layer develop?

(1)

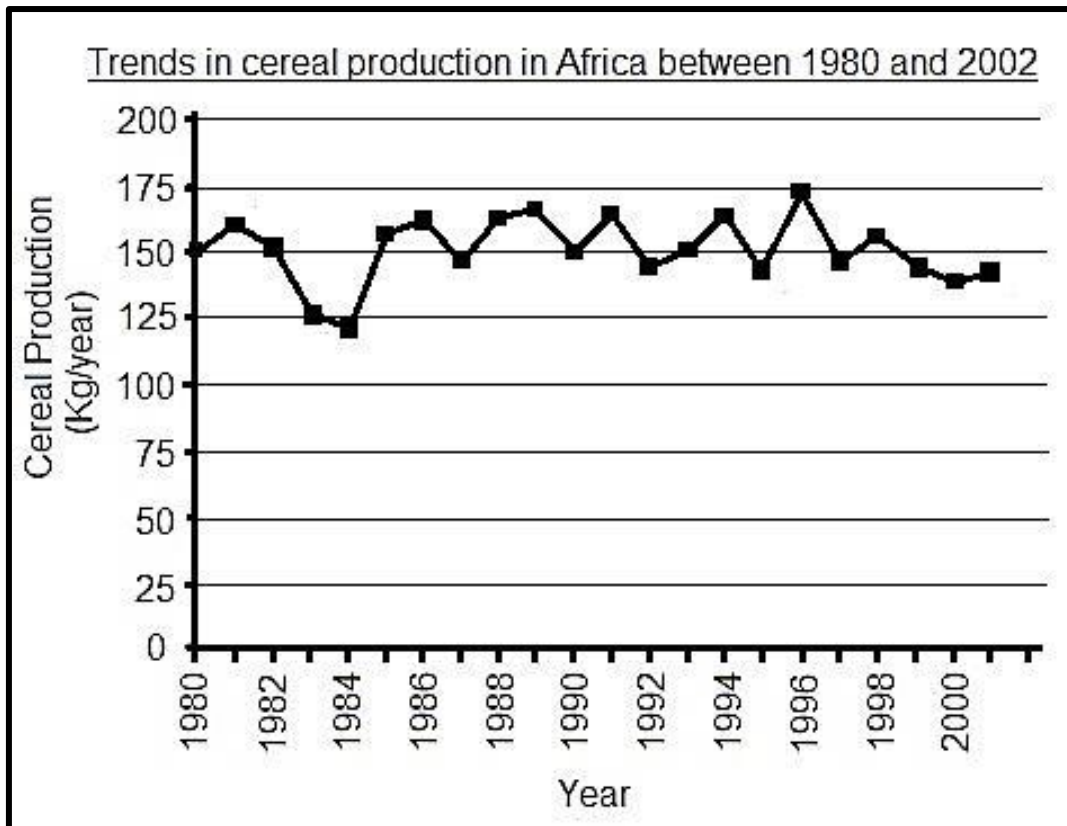
3.2 Some areas in South Africa receive dangerously high levels of UV-B radiation, for example in De Aar, in the Northern Cape, as shown in the diagram below. Study the diagram and answer the questions that follow.



- 3.2.1 In which year were, complete records kept? How do you know this? (2)
- 3.2.2 During which FOUR months of the year 1997 were the UV-B radiation the most dangerous? (1)
- 3.2.3 Name TWO harmful ozone-depleting substances. (2)
- 3.2.4 List and briefly explain TWO effects of ozone depletion on the ecosystem. (4)
- 3.2.5 Does ozone depletion contribute to desertification? Explain. (2)

- 3.3 In Africa where the population is increasing, production per capita (average production per person) is low, compared to continents such as Asia and Latin America. This is because of limited use of agricultural technologies, which could increase production. Production is also affected by possible disasters.

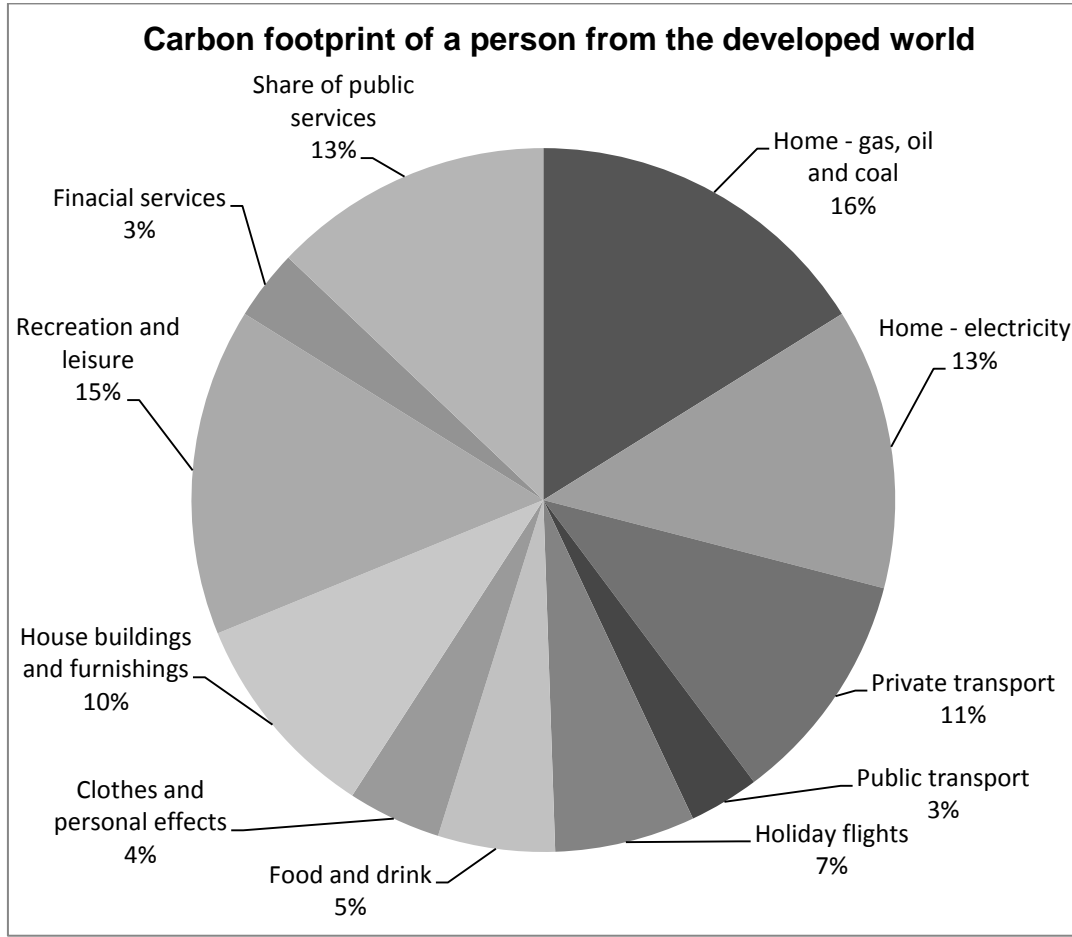
Study the graph below and answer the questions that follow.



- 3.3.1 What was the yield of cereal in 1982 and in 2000? (2)
- 3.3.2 Explain what happened to the yields between 1982 and 1986. (2)
- 3.3.3 Describe in detail, the trend shown in all the data on the graph. (2)
- 3.3.4 Based on your answer to QUESTION 3.3.3, comment on future food security in Africa. (3)

3.4 The environmental impact of the amount of carbon dioxide emitted during the life span of the use of a product, or a service by a person from a developed country, is shown in the pie chart below.

Study the chart and answer the questions that follow.



- 3.4.1 Distinguish between primary and secondary carbon footprint. (2)
- 3.4.2 Which TWO activities contribute the most to the carbon footprint? (2)
- 3.4.3 Name TWO activities that contribute the least to our carbon footprint. (2)
- 3.4.4 The use of gas, oil, coal, and electricity make up 29% of a person’s carbon footprint. Suggest FOUR ways in which you could reduce your carbon footprint. (4)

[40]

**TOTAL SECTION B: 80**

**SECTION C****QUESTION 4**

- 4.1 "Solid waste has become a great cause for concern in South Africa. Each person in South Africa generates between 0,5 kg to 2 kg of waste every day. This equates to about 15 million tons of domestic waste each year."

If you were appointed as the head of the waste disposal division of your town/city, explain FOUR strategies you would use to manage the waste.

Content (17)  
Synthesis (3)

**NOTE:** NO marks will be awarded for answers in the form of flow charts or diagrams.

**TOTAL SECTION C: 20**  
**GRAND TOTAL: 150**



