



GAUTENG DEPARTMENT OF EDUCATION

PREPARATORY EXAMINATION 2009

10642

AGRICULTURAL SCIENCES

Second Paper

13 pages

AGRICULTURAL SCIENCES: Paper 2
AGRS



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GAUTENG DEPARTMENT OF EDUCATION
PREPARATORY EXAMINATION

AGRICULTURAL SCIENCES
(Second Paper)

TIME: 2½ hours

MARKS: 150

INSTRUCTIONS:

- Answer ALL the questions from SECTIONS A and B.
 - Section A (Question 1) must be answered on the provided ANSWER SHEET.
 - Section B (Questions 2 to 4) must be answered in the ANSWER BOOK.
 - Start each question from SECTION B on a new page.
 - Study the questions carefully and make sure you answer what is asked.
 - Number the answers correctly according to the question paper.
 - Work neatly.
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SECTION A

QUESTION 1

- 1.1 Various possible options are provided as answers to the following questions. Choose the correct answer and make a cross (X) in the block next to the question number (1.1.1 – 1.1.10) on the attached ANSWER SHEET.

1.1.1 Increased scarcity of farm labourers may be the result of

- A. political instability.
- B. less attractive working conditions.
- C. unskillfulness.
- D. ineffective labour management.

1.1.2 Factors that hamper the marketing of agricultural products include

- A. perishability of produce.
- B. monthly fluctuations in production.
- C. marketing costs.
- D. price of the product.

- 1.1.3 Which of the illustrated landscapes below, in terms of their agricultural potential, represents soil that has no capability for arable cultivation or permanent pasture?

Diagram A

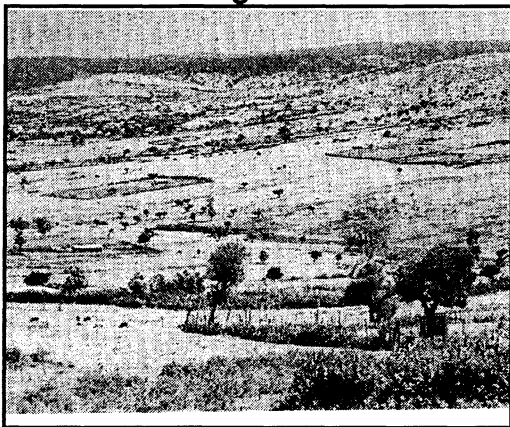


Diagram B

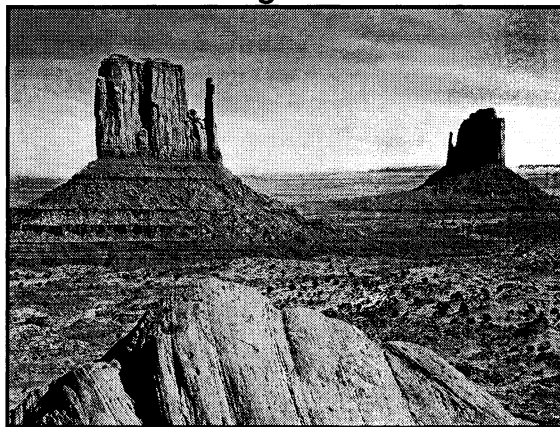


Diagram C

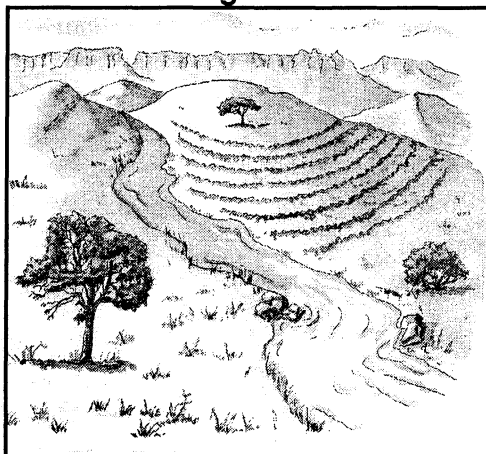
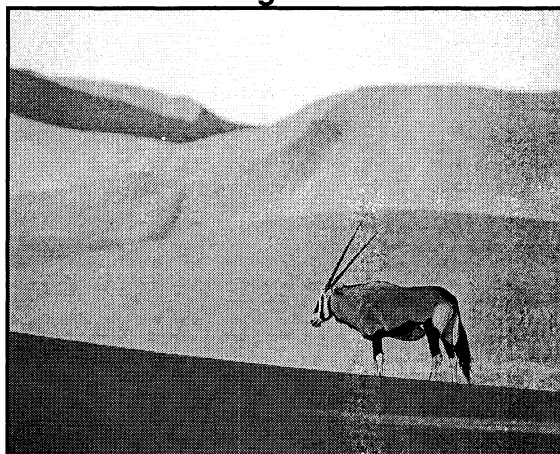


Diagram D



- A. Diagram D and B
B. Diagram A and C
C. Diagram B
D. None of the above-mentioned.
- 1.1.4 A condition where the required quantity of a product is exactly equal to the quantity that sellers are prepared to sell, is known as
- A. the ceiling price.
B. the floor price.
C. market equilibrium.
D. surplus removal.

- 1.1.5 The crossing of plants with red flowers (RR) and plants with white flowers (rr) will give only red flowers in the F1 generation. The genotype of the parents will be
- A. Rr X Rr.
 - B. RR X rr.
 - C. RR X RR.
 - D. Rr X rr.
- 1.1.6 Specialization is the opposite of
- A. segregation.
 - B. mutualisation.
 - C. diversification.
 - D. segmentation.
- 1.1.7 In South Africa one of the following Acts applies to farm workers:
- A. Basic Conditions of Employment Act of 1997
 - B. Labour Teenage Act of 1998
 - C. Extension of Security of Tenure Act 62 of 1997
 - D. Labour Disputes Act of 1994
- 1.1.8 One the following concepts does NOT fit the rest.
- A. Capital
 - B. Soil
 - C. Cultivation
 - D. Labour
- 1.1.9 Which one of the following is NOT an advantage of the free-market system?
- A. Marketing can be highly specialized.
 - B. Exploitation of producers by buyers
 - C. High marketing costs
 - D. Focuses on transformation and packaging
- 1.1.10 Mendel's Law that concludes that each allele pair with contrasting characteristics that separates independently from each other is known as the law of _____ and _____.
- A. dominance
 - B. independent assortment
 - C. segregation
 - D. independent recombination

2x10=(20)

- 1.2 In the table below, a statement and two answers are given. Decide whether the statement in **COLUMN B** relates to **only A**, **only B**, **both A and B** or **none**, of the answers in **COLUMN A**. Make a cross (X) in the block next to the question number (1.2.1 – 1.2.5) on the attached ANSWER SHEET.

Example:

COLUMN A		COLUMN B
A:	Risk management	Qualities of an entrepreneur
B:	Innovation	

Answer:

The statement refers to:			
Only A	Only B	A and B	None
A	B	C	D

COLUMN A ANSWERS			COLUMN B STATEMENT
1.2.1	A:	Genetic variation	The movement of genetic material between organisms
	B:	Genetic engineering	
1.2.2	A:	Temporary labour	Different types of business managers
	B:	Permanent labour	
1.2.3	A:	High-risk factor	Problems associated with capital
	B:	Overcapitalization	
1.2.4	A:	Climate	Environmental factors that influence variation in livestock
	B:	Mutation	
1.2.5	A:	Transportation	The functions of marketing
	B:	Storage	

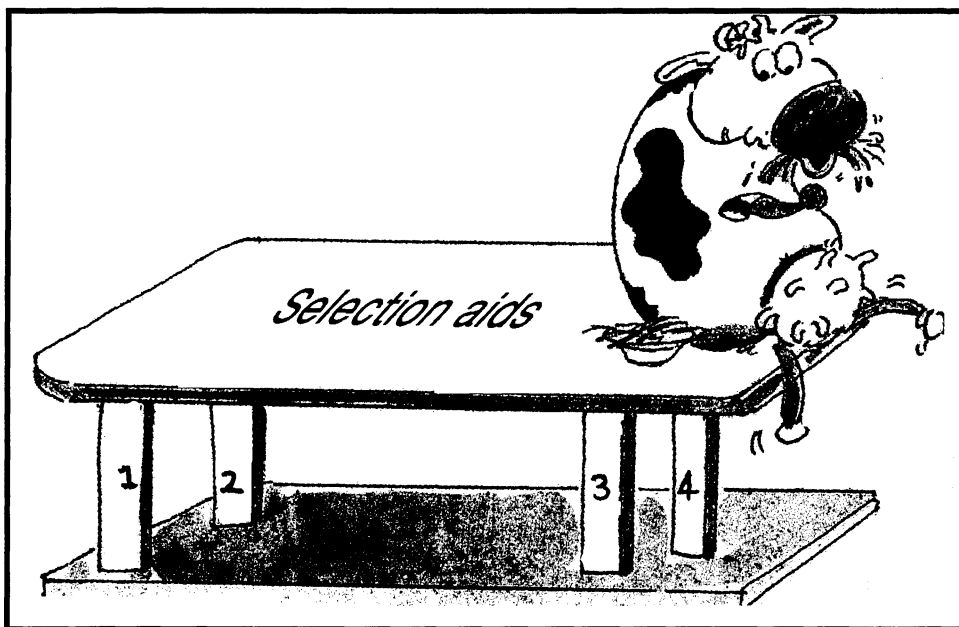
5x2=(10)

1.3 Supply the correct term for each of the following statements.

- 1.3.1 The presence of two or more alleles of a gene in a gene pool
- 1.3.2 The means by which the selling of agricultural products is promoted
- 1.3.3 An organism used to modify genes genetically, found naturally in soil
- 1.3.4 The result of the interaction of demand and supply on a market
- 1.3.5 Labourers that are employed for the repetitive tasks such as the seasonal harvesting of crops

5x2=(10)

1.4 Study the diagram below. Breeding may be compared with a table that stands on four legs. Each leg may be seen as an aid to the farmer when it comes to the selection of animals. If one leg is longer or shorter than the others, the table will be unstable.



- 1.4.1 Identify these selection aids numbered 1 to 4. (4)
- 1.4.2 Identify ONE physical characteristic that makes the Nguni cattle ideal for selection purposes. (1)

TOTAL FOR SECTION A: [45]

QUESTION 2

MANAGEMENT/MARKETING

2.1 Successful entrepreneurs have certain entrepreneurial and personal traits, as well as managerial skills. Entrepreneurs can capitalize on their strengths and concentrate on improving their weaknesses.

2.1.1 In your own words, define the concept *entrepreneurialship*. (2)

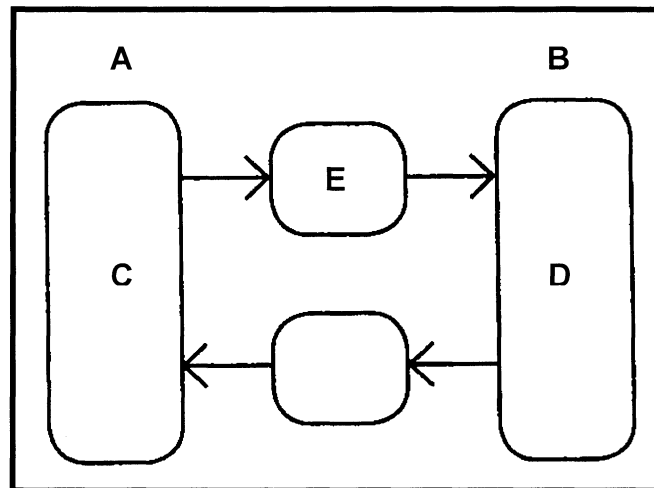
2.1.2 Justify the above statement by indicating THREE managerial factors that will ensure the success of an entrepreneur. (3)

2.2 The process by which an entrepreneurial venture is created by an entrepreneur is defined as the entrepreneurial process. It consists of FOUR distinct phases.

2.2.1 Summarise the FOUR phases of the entrepreneurial process (4)

2.2.2 A business plan is a plan of action that the entrepreneur has for his/her business. List the THREE main components of a good business plan. (3)

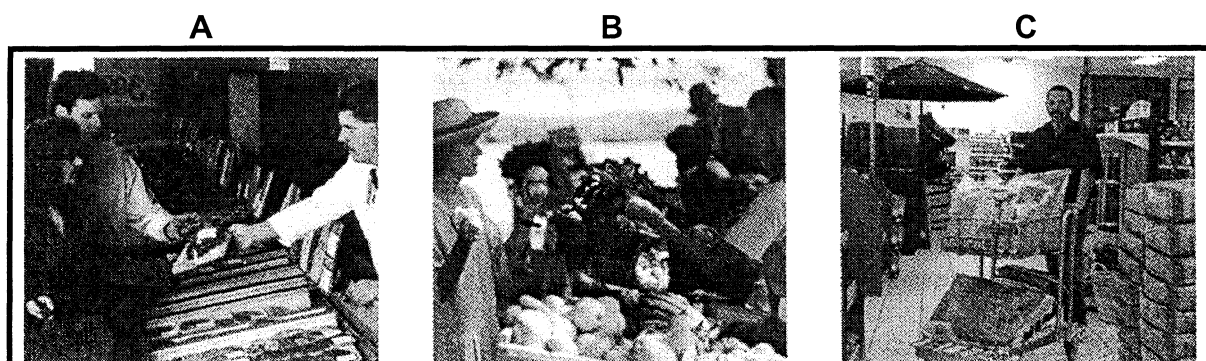
2.3 The blank diagram below represents a production conversion process.



2.3.1 Identify components A, B, C and D. (4)

2.3.2 List THREE examples of A in frame E. (3)

- 2.4 The pictures below indicate different forms of marketing in agriculture, in a free marketing system.



- 2.4.1 Identify A, B and C. (3)

- 2.4.2 Determine TWO advantages of the marketing system shown above. (2)

- 2.5 The table below lists the quantity of potatoes that producers wish to sell at different prices.

Row	Price per kg (Rand)	Quantity of Potatoes supplied
U	5	1
V	10	4
W	15	8
X	20	10
Y	25	11
Z	30	12

- 2.5.1 Plot a line graph with price on the vertical axis (Y) and quantity on the horizontal axis (X). (6)

- 2.5.2 Determine what curve in marketing is depicted by the graph. (1)

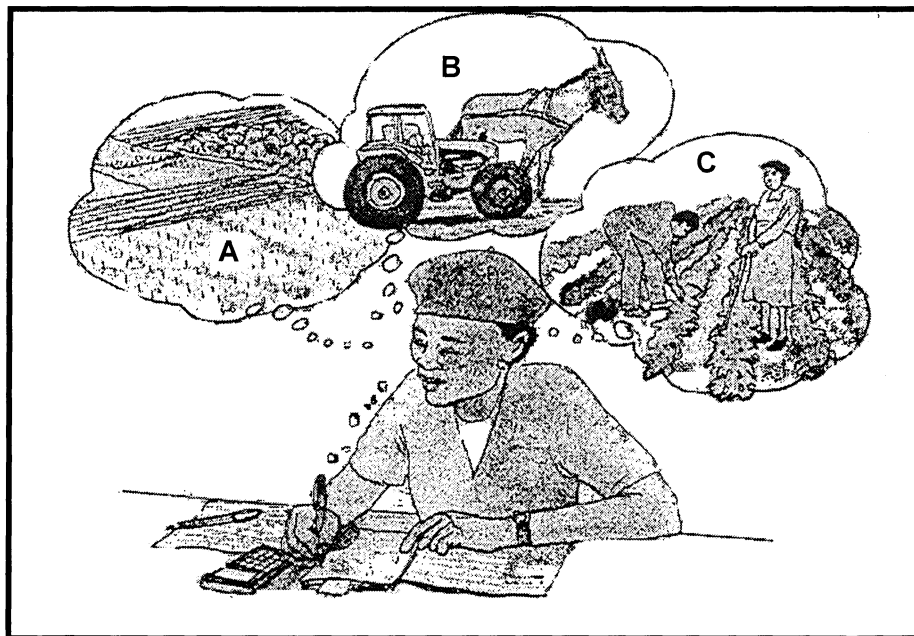
- 2.5.3 Using the graph, explain the concept of price elasticity. (4)

[35]

QUESTION 3

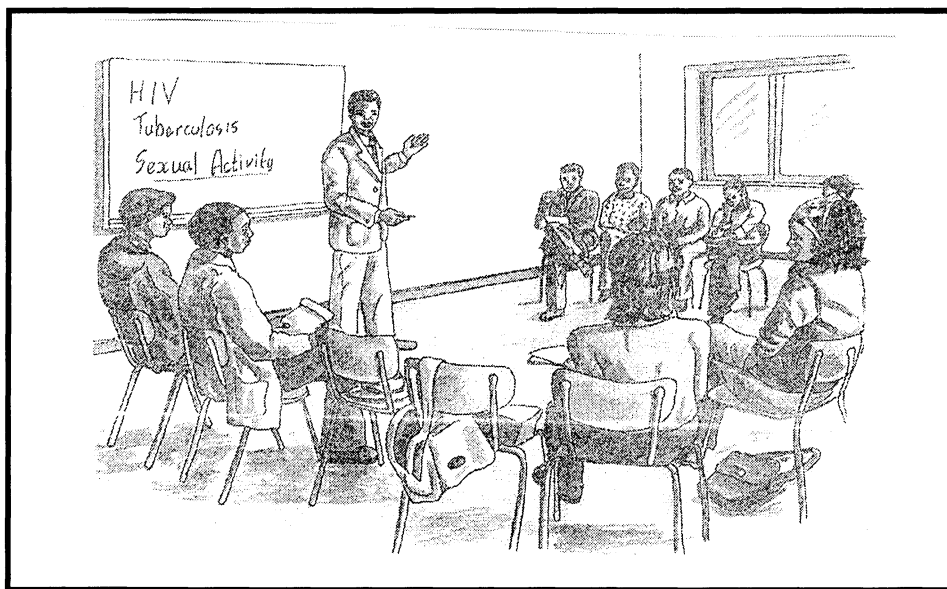
PRODUCTION FACTORS AND MANAGEMENT

- 3.1 In contrast to labour, which is primarily a physical process, management is primarily a mental process. Management is therefore the ability of a manager to apply his or her mental capabilities like planning, decision-making, monitoring, etc. to the production process. Management is also required for the efficient economic coordination of factors of production, as illustrated in the picture below.

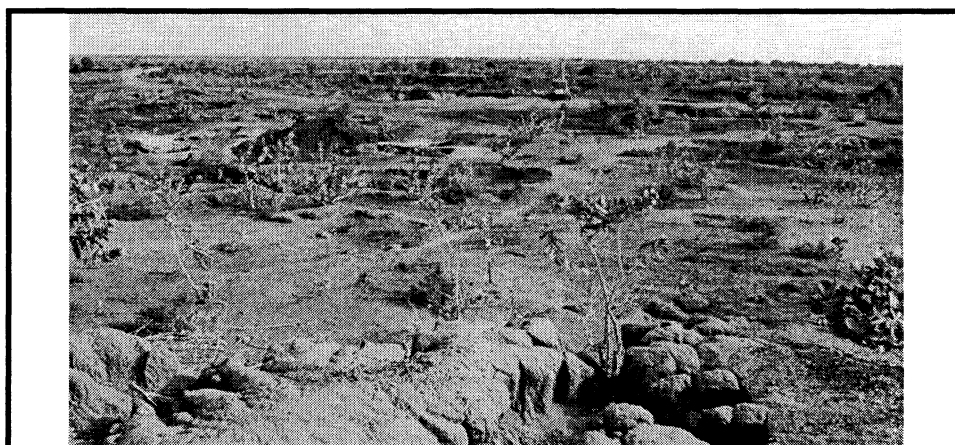


- 3.1.1 Provide THREE basic management functions that may affect the profitability of a farm if not performed properly by the farm manager. (3)
- 3.1.2 From the picture above, select THREE factors of production that must be efficiently managed by managers. (3)
- 3.1.3 Outline the THREE main environments that influence management on a flow diagram. (3)

- 3.2 HIV/Aids impacts negatively on the productivity of farm labourers on both the commercial and subsistence farming sector which in return impacts negatively on the productivity of the agricultural sector. HIV/Aids makes planning extremely difficult because of unplanned absenteeism. It makes it difficult to complete agricultural operations on time. The loss of skills and experience led to farmer Botolo organizing an Aids Lekgotla as illustrated below, to create awareness.



- 3.2.1 Select THREE ways in which HIV/Aids impacts on the farm. (3)
- 3.2.2 Name THREE aspects that were discussed during the HIV/Aids awareness Lekgotla. (3)
- 3.2.3 Provide TWO steps farmers can take to limit the impact of HIV/Aids. (2)
- 3.3 Study the photograph of land that has become degraded.



- 3.3.1 Determine how this land became degraded. (2)
- 3.3.2 Suggest TWO ways in which land degradation can contribute to rural poverty. (2)

- 3.3.3 Supply ONE law that has been introduced to control and or manage natural resources in South Africa. (1)

3.4 CASE STUDY

Nomakhosi owns three hectares of arable land with access to irrigation and has previously grown vegetables. She has heard that there is a strong demand for baby vegetables and for organic beef in Europe. The South African government supports Black Economic Empowerment initiatives and provides favourable loan arrangements.

Nomakhosi does not have experience in the production of baby vegetables or the export of produce. She has access to technical expertise from her local extension officer. She also has to consider the fact that vegetable production is intensive and minimum wages are fairly high. Exchange rates are also very unstable.

- 3.4.1 List TWO weaknesses that Nomakhosi has. (2)
- 3.4.2 Select an opportunity and a challenge that Nomakhosi can exploit if she decides to pursue/take up this challenge. (2)
- 3.4.3 Determine TWO managerial strategies that she could implement to take advantage of this opportunity. (2)
- 3.4.4 Advise Nomakhosi with regard to where she can obtain financial assistance. (1)
- 3.4.5 There are TWO important types of budgets that she must draw up as a farm manager. Name these budgets AND state how they differ from each other. (4)
- 3.4.6 Indicate TWO types of records that must be kept by Nomakhosi as a farm manager. (2)
- [35]**

QUESTION 4

- 4.1 The list below shows factors that affect the growth of a beef calf from birth to weaning.

Climate	disease	growth genes	milk quality
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- 4.1.1 Identify which factors are
- (a) genetic factors. (2)
- (b) environmental factors. (2)
- 4.1.2 Determine how a beef farmer can improve the growth of his beef calves from birth to weaning. (3)

4.1.3 Predict whether the calves' birth masses will show continuous or discontinuous variation. (1)

4.1.4 Justify your prediction in Question 4.1.3. (2)

4.2 A pure cattle breed with a black bull BB is crossed with a pure cattle breed with a white cow bb.

4.2.1 Give a schematic presentation of the genotype and phenotype up to and including the F1-generation. (5)

4.2.2 Explain what is meant by the following:

"All line breeding is a form of inbreeding, but all breeding is not necessarily line breeding." (2)

4.3 A dairy farmer measured the milk yield of each cow in his herd of 64 cows. The following measurements were obtained:

Average milk yield (L)/300 days	Number of cows
3 600	1
4 000	7
4 400	16
4 800	20
5 200	14
5 600	5
6 000	1

4.3.1 Draw a line graph to show the variation in the milk yield of the cows. (6)

4.3.2 Indicate the type of variation shown in the milk yield. (1)

4.3.3 Identify the groups you would select for breeding in order to increase the milk yield average of the herd. (2)

4.3.4 Distinguish between continuous variation and discontinuous variation. (4)

4.4 Write a paragraph that could be used to create awareness among the public about what Genetically Modified Organisms (GMO) are and how they are developed. (5)
[35]

TOTAL FOR SECTION B: [105]

TOTAL: 150

ANSWER SHEET / ANTWOORDBLAD

SECTION / AFDELING A

NAME / NAAM: _____

QUESTION / VRAAG 1.1

1.1.1	A	B	C	D
1.1.2	A	B	C	D
1.1.3	A	B	C	D
1.1.4	A	B	C	D
1.1.5	A	B	C	D
1.1.6	A	B	C	D
1.1.7	A	B	C	D
1.1.8	A	B	C	D
1.1.9	A	B	C	D
1.1.10	A	B	C	D

(10 x 2) (20)

QUESTION 1.2

	Only A	Only B	A & B	None
1.2.1	A	B	B	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

VRAAG 1.2

	Slegs A	Slegs B	A & B	Geen
1.2.1	A	B	C	D
1.2.2	A	B	C	D
1.2.3	A	B	C	D
1.2.4	A	B	C	D
1.2.5	A	B	C	D

(5 x 2) (10)

QUESTION / VRAAG 1.3

1.3.1 _____
 1.3.2 _____
 1.3.3 _____
 1.3.4 _____
 1.3.5 _____
 (5 x 2) (10)

QUESTION / VRAAG 1.4

1.4.1 i _____
 ii _____
 iii _____
 iv _____
 1.4.2 _____

(5 x 1) (5)

TOTAL SECTION / TOTAAL AFDELING A: 45