Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

BIOLOGY **0610/32**

Paper 3 Theory (Core) **February/March 2016**

1 hour 15 minutes

Candidates answer on the Question Paper.

No Additional Materials are required.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

This document consists of **17** printed pages and **3** blank pages.

CAMBRIDGE International Examinations

[Turn over

BLANK PAGE

1 The boxes on the left contain the names of characteristics of living organisms.
The boxes on the right contain the definitions of these characteristics.

Draw **one** straight line to link the characteristic with its correct definition.

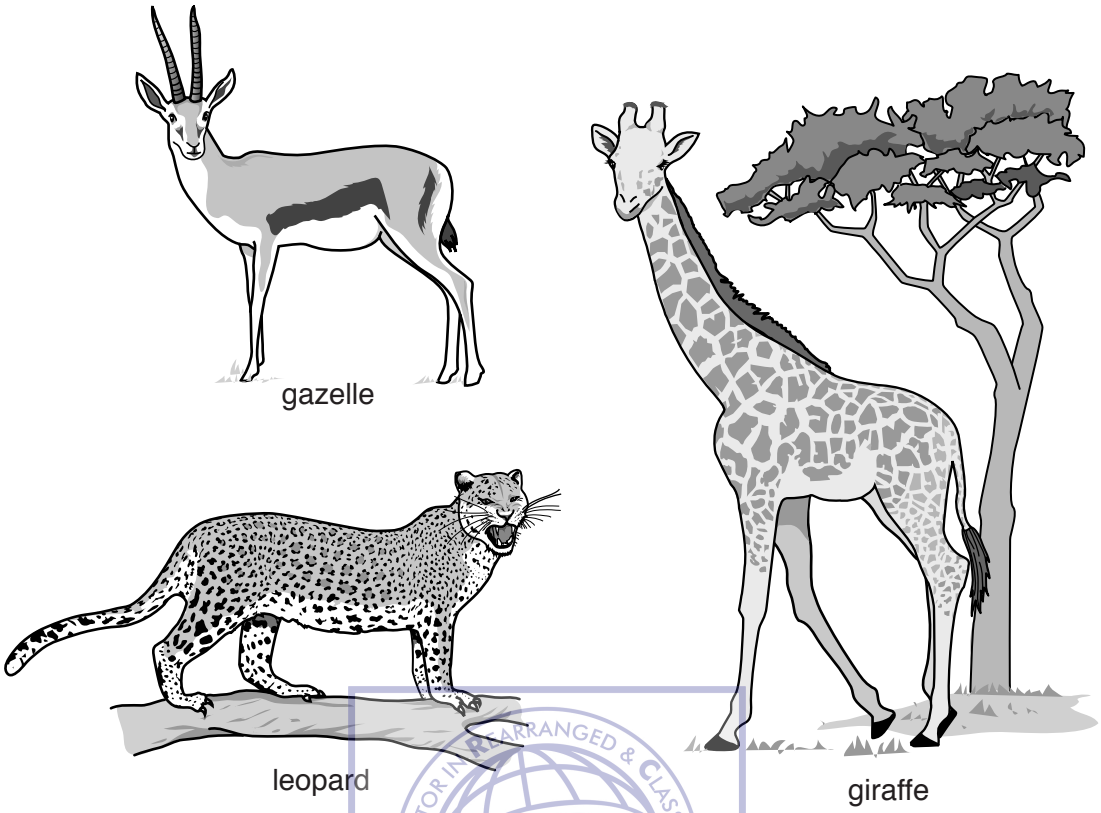
An example has been done for you.

characteristic	definition
sensitivity	chemical reactions in cells that break down nutrient molecules and release energy
respiration	the ability to detect and respond to changes in the environment
nutrition	taking in of materials for energy, growth and development
excretion	an action by an organism causing a change of position or place
movement	removal from organisms of toxic materials and substances in excess of requirements
reproduction	a permanent increase in size
growth	the processes that make more of the same kind of organism

[5]

[Total: 5]

2 Fig. 2.1 shows three mammals.



not drawn to scale

Fig. 2.1

For each mammal, choose **one** adaptive feature **visible** in Fig. 2.1 and outline how it helps the mammal to survive in its environment.

Choose a **different** feature for each mammal.

Write your answers in Table 2.1.

Table 2.1

name of mammal	adaptive feature	how feature helps the mammal to survive in its environment
gazelle		
giraffe		
leopard		

[6]

[Total: 6]

3 **(a)** Define the term *enzyme*.

.....

.....

.....

.....

..... [2]

(b) **(i)** Fig. 3.1 shows a diagram of part of the human alimentary canal and associated organs.

Name the structures labelled **A**, **B**, **C** and **D**.

Write your answers on Fig. 3.1.

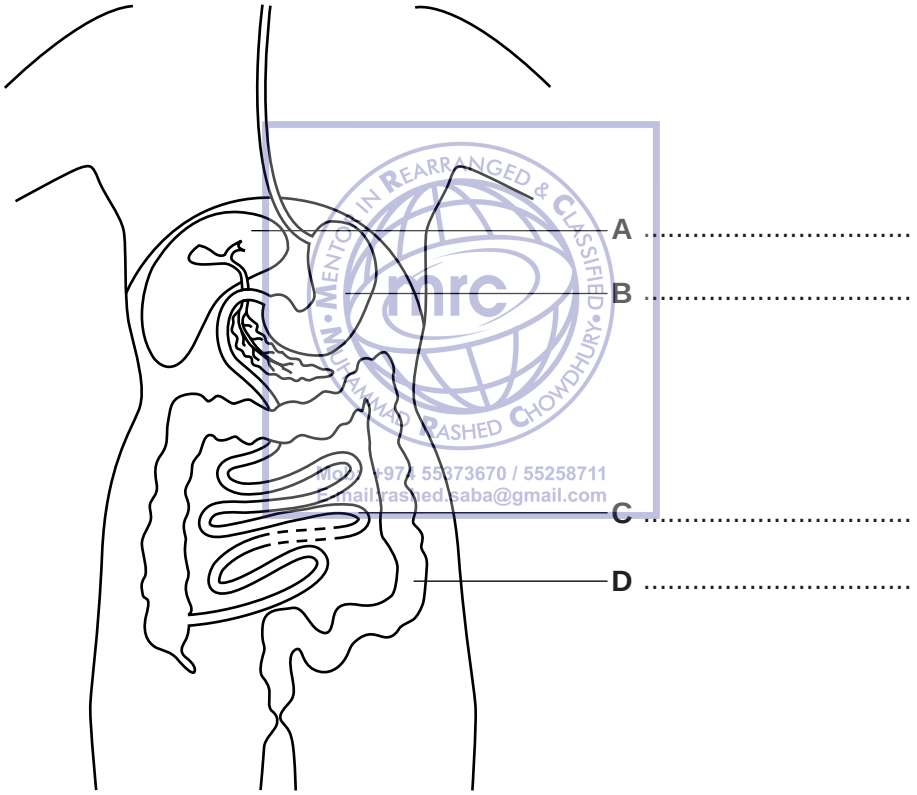


Fig. 3.1

[4]

(ii) Fig. 3.2 also shows a diagram of part of the human alimentary canal and associated organs.

On Fig. 3.2, draw label lines with letters to show:

E where hydrochloric acid is made

F where bile is made

G where amylase is made

H where egestion occurs.

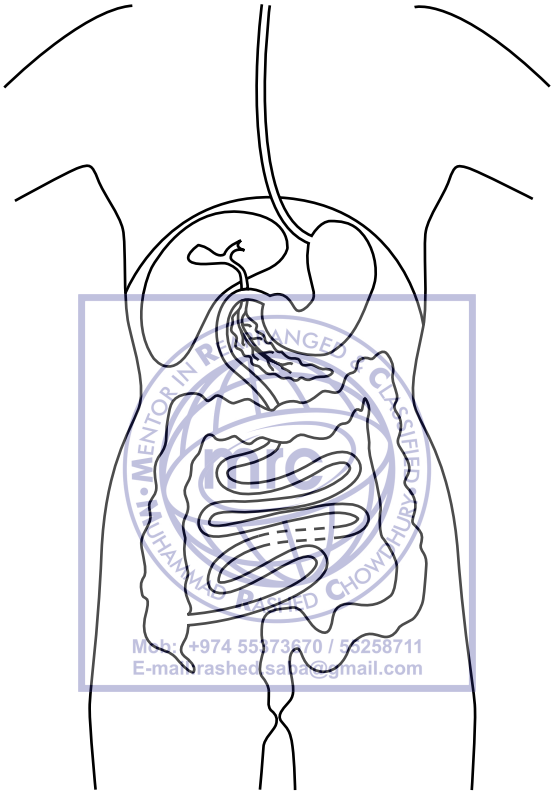


Fig. 3.2

[4]

(c) (i) State where digested food is absorbed.

.....

..... [1]

(ii) Digestion of carbohydrate produces glucose.

Describe the absorption of glucose.

.....

.....

.....

.....

..... [2]

[Total: 13]

4 **(a)** This question is about sexual reproduction in humans.

Choose words from the list to complete the sentences below.

Words may be used once, more than once or not at all.

cervix **egg cell** **embryo** **gamete**

ovary **prostate gland** **scrotum**

testes **uterus** **vagina** **zygote**

Sperm are produced in the ..... of the male.

A sperm is produced by meiosis and is an example of a cell called a ..... .

During sexual intercourse sperm are released into the ..... of the female.

At fertilisation a sperm fuses with the ..... to form a ..... which travels to the ..... where it develops into an ..... .

[7]

(b) At the end of pregnancy a woman goes into labour and the baby is born.

Outline the stages involved in labour and birth.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 11]

5 An investigation was carried out into the blood flow in different parts of the body when resting and during mild exercise.

Fig. 5.1 shows the results for the skeletal muscles, the skin and the alimentary canal.

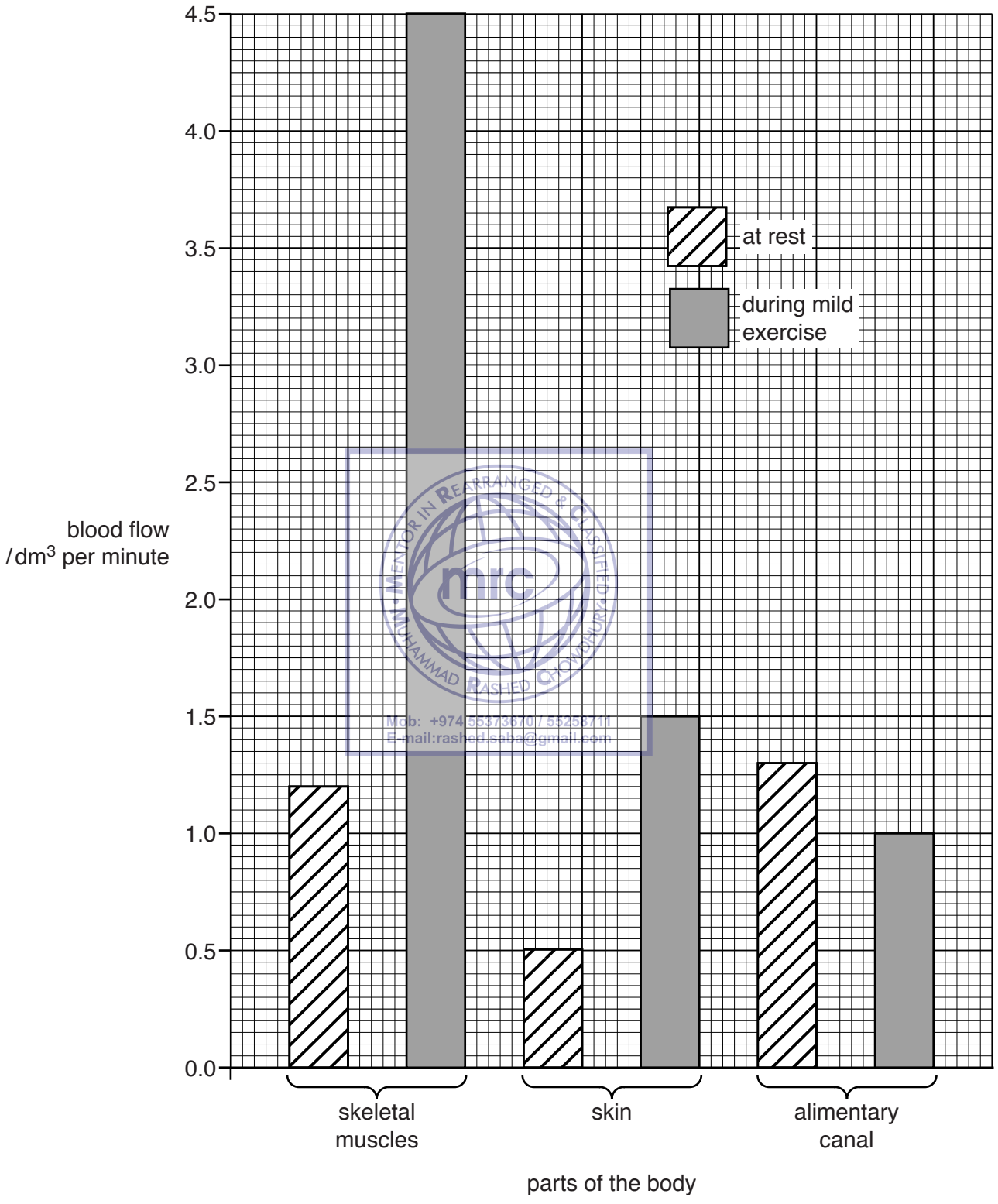


Fig. 5.1

(a) **(i)** Use Fig. 5.1 to state the blood flow to the skeletal muscles when at rest.

..... dm^3 per minute [1]

(ii) Use Fig. 5.1 to state the difference in blood flow to the skeletal muscles between rest and during mild exercise.

Show your working.

..... dm^3 per minute [2]

(b) Suggest why increased blood flow to the skeletal muscles is necessary during mild exercise.

.....

.....

.....

.....

.....

.....

..... [3]

(c) At rest, the blood flow to the skin is 0.5 dm^3 per minute. During mild exercise this increases to 1.5 dm^3 per minute.

(i) Calculate the percentage increase in blood flow to the skin during mild exercise.

Show your working.

.....% [2]

(ii) Outline the reason for this increased blood flow to the skin.

.....

.....

.....

.....

.....

.....

..... [3]

(d) Suggest why the blood flow to the alimentary canal decreases during mild exercise.

.....

.....

..... [1]

(e) The blood flow to the brain stays the same during rest and exercise.

Suggest **two** reasons for this unchanged blood flow.

.....

.....

.....

.....

..... [2]

[Total: 14]

6 (a) (i) Define the term *chromosome*.

.....

.....

.....

.....

..... [2]

(ii) Fig. 6.1 shows a plant cell.

On Fig. 6.1, draw a line labelled **W** to show where chromosomes are found in this cell.

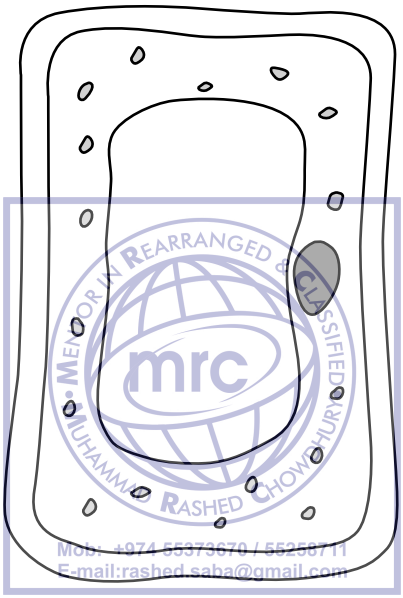


Fig. 6.1

[1]

(b) In mice the allele for black fur (**B**) is dominant to the allele for white fur (**b**).

A mouse with black fur was mated with a mouse with white fur.

The mouse with black fur had the genotype **Bb**.

Complete Fig. 6.2 to show how fur colour is inherited by the offspring of this mating.

parental phenotypes	black fur	×	white fur	
parental genotypes	.....	×	.....	
gametes	..... + ...	×	..... + ...	
Punnett Square				
offspring genotypes	.....	.....	.....	.....
offspring phenotypes	.....	.....	.....	.....
ratio	..... black : ..... white			

Fig. 6.2

[5]

(c) Sex inheritance in mice is the same as in humans.

State the sex chromosomes of a male mouse and a female mouse.

male mouse .....

female mouse .....

[2]

[Total: 10]

7 Fig. 7.1 shows a section through a leaf.

(a) Name the structures labelled **J** and **K**.

Write your answers on Fig. 7.1.

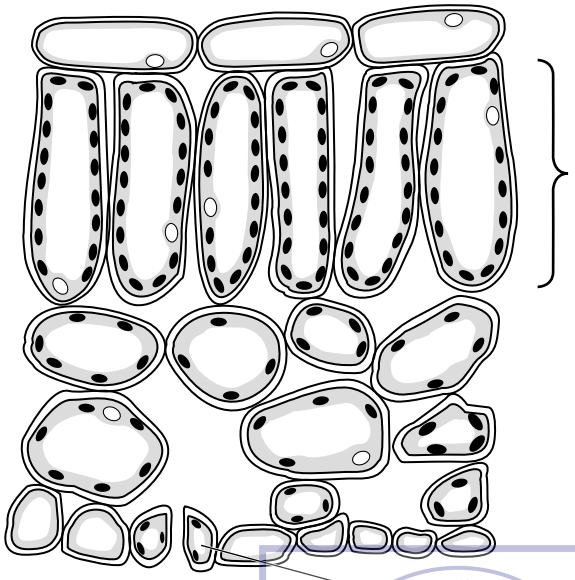


Fig. 7.1

[2]

(b) Leaves carry out photosynthesis.

Write the word equation for photosynthesis.

..... + ... $\xrightarrow{\text{light}}$ ..... + ...
chlorophyll

[2]

(c) Maize plants photosynthesise to produce the chemicals needed to form corn cobs.
Corn cobs are food for humans.

In an investigation, six similar fields of maize seedlings had different quantities of fertiliser added.
The mass of corn cobs produced by each field was calculated.

The results are shown in Fig. 7.2.

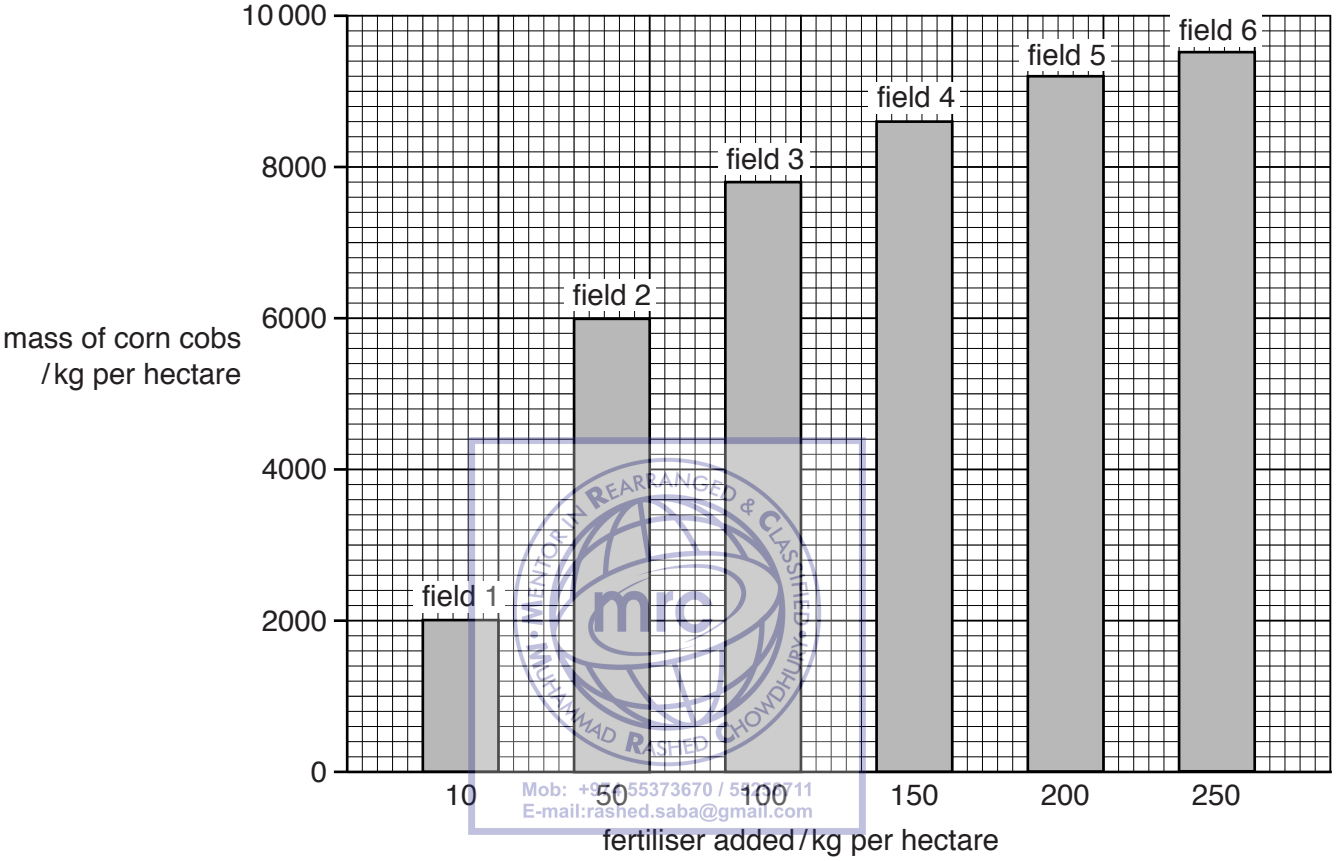


Fig. 7.2

(i) Describe the results of the investigation shown in Fig. 7.2.

.....

.....

.....

..... [2]

(ii) State **two** factors, other than adding fertiliser, which can affect the rate of photosynthesis.

1 .....

2 .....
[2]

(d) (i) Explain how the use of herbicides improves the yields from crop plants such as maize.

.....

.....

.....

.....

..... [2]

(ii) Suggest how genetic engineering could reduce the use of insecticides on farms.

.....

.....

.....

.....

..... [2]

[Total: 12]

8 **(a)** Name the **two** components that form the central nervous system (CNS).

1 .....

2 .....
[2]

(b) Sense organs respond to specific stimuli.

Name **three** different stimuli that the sense organs in the human body can detect.

1 .....

2 .....

3 .....
[3]

(c) A student picks up a very hot object and immediately drops it.

Describe what happens in this reflex action.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 9]

BLANK PAGE

BLANK PAGE