Inheritance

Question Paper

Level	IGCSE
Subject	Biology
Exam Board	CIE
Topic	Inheritance
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Question Paper

Time Allowed: **28 minutes**

Score: **/23**

Percentage: **/100**

1 Fig. 2.1 shows part of a yellow maize cob, *Zea mays*.

A cob is composed of many individual fruits known as grains.

Fig. 2.1

Many colours of maize grains are known. The colour is inherited.

Fig. 2.2 shows part of a cob with light and dark coloured grains.

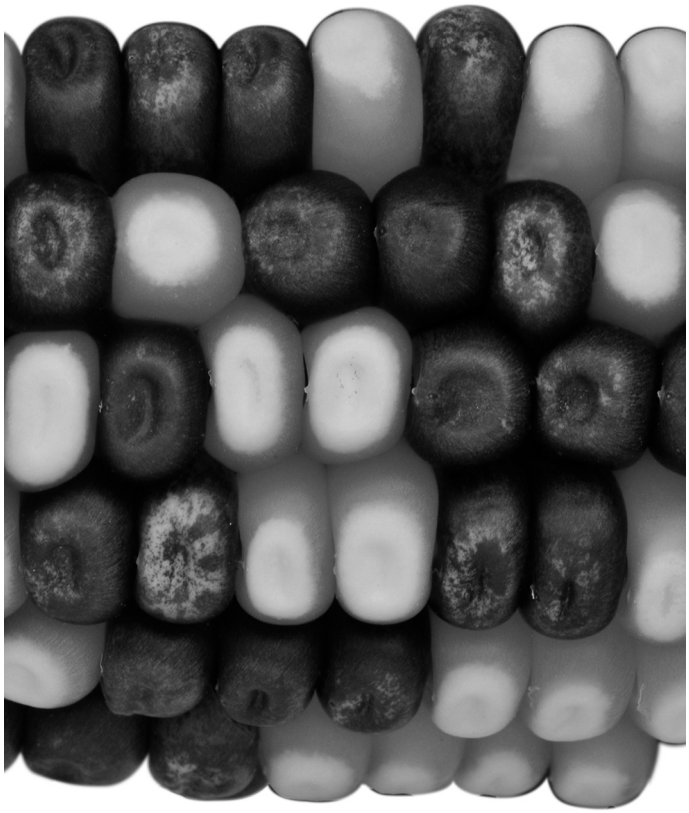

Fig. 2.2

(a) **(i)** Complete Table 2.1 by counting the number of light and dark coloured grains.

Table 2.1

number of grains	
light	dark

[1]

(ii) Use the data in Table 2.1 to suggest the phenotypic ratio of light to dark coloured grains.

..... [1]

(iii) Describe **one** visible phenotypic difference, other than colour, between the grains shown in Fig. 2.2.

.....

..... [1]

Maize is used as a food source for humans and livestock. It contains mainly starch but also other nutrients including proteins and fat.

(b) Describe how to test maize grains for the presence of protein and fat.

protein .....

.....

.....

.....

fat .....

.....

.....

.....

[5]

Maize is a cereal. Cereals form a high proportion of the daily energy intake for many people.

The protein and fat content of maize and five other cereals is shown in Table 2.2.

Table 2.2

cereal	content per 100 g of dried cereal / g	
	protein	fat
maize	9.	3.8
millet	10.4	5.0
oats	12.6	7.5
rice	7.1	1.8
sorghum	9.7	3.4
wheat	13.8	2.0

(c) Use Table 2.2 to identify the cereal that provides the largest energy content per 100 g.

Explain your choice of cereal.

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.....

.....

.....

.....

..... [3]

[Total: 11]

2 There is variation in the shape of human thumbs.

Fig. 3.1 shows the two forms referred to as 'straight' and 'hitch hikers'.

straight hitch hikers

Fig. 3.1

A survey of thumb shape was carried out on 197 students. The results are shown in Table 3.1.

Table 3.1

age / years	number of students with 'straight' thumbs		number of students with 'hitch hiker' thumbs	
	male	female	male	female
12	21	24	4	2
13	18	28	3	5
14	19	15	2	3
15	26	20	3	4
total	84	87	12	14

(a) Describe the results shown in Table 3.1.

.....

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.....

.....

..... [3]

(b) Scientists think that thumb shape is controlled by a single gene.

What evidence is there from Table 3.1 to support this idea?

.....

.....

..... [3]

[Total : 6]

3 Fig. 3.1 shows part of a root tip cut longitudinally. The section has been stained to show the DNA of the nucleus.

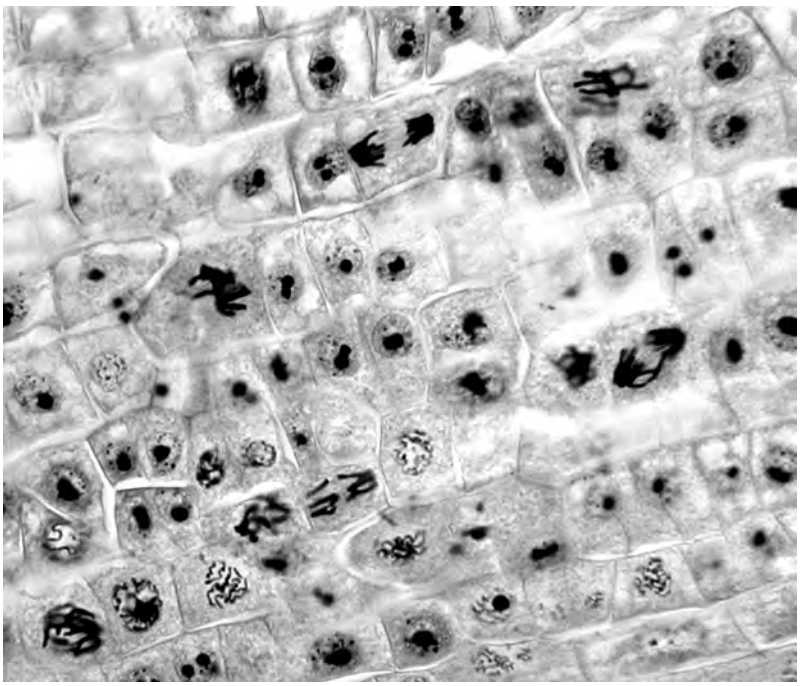

Fig. 3.1

(a) (i) Draw a circle around a cell that shows the 'daughter' chromosomes have just separated at the equator and are moving towards the poles of the cell (anaphase). [1]

(ii) Describe two visible features of these dividing cells.

1 .....

2 ..... [2]

(iii) Name the type of cell division taking place.

..... [1]

(b) Suggest what happens to these cells after cell division, as the root grows.

.....

.....

..... [2]

[Total: 6]