Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

5042397029

BIOLOGY **5090/32**

Paper 3 Practical Test **October/November 2018**

1 hour 15 minutes

Candidates answer on the Question Paper.

Additional Materials: As listed in the Confidential Instructions.

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.
Write your answers in the spaces provided on the Question Paper.

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.

For Examiner's Use	
1	
2	
3	
Total	

This document consists of **9** printed pages and **3** blank pages.

CAMBRIDGE International Examinations

In order to plan the best use of your time, read through all the questions on this paper carefully before starting work.

1 Certain bacteria are important in the production of yoghurt. Live yoghurt contains these living bacteria.

A small volume of live yoghurt can be added to milk and, given suitable conditions, the bacteria will change the milk into yoghurt.

You are provided with labelled samples of **milk** and **live yoghurt**.

- Label a small, empty beaker **yoghurt-milk mixture**.
- Use the measuring cylinder to measure 50 cm^3 of milk and add it to the beaker labelled yoghurt-milk mixture.
- Use the syringe to measure 2.5 cm^3 of live yoghurt and add it to the milk in the beaker labelled yoghurt-milk mixture.
- Stir this mixture well.

(a) Examine the contents of the containers of milk, yoghurt-milk mixture and live yoghurt to observe their colour and how liquid they are.

(i) Record your observations in the table. [3]

sample	observations	pH
milk		
yoghurt-milk mixture		
live yoghurt		

(ii) Use pH indicator paper to find the pH of the milk, yoghurt-milk mixture and live yoghurt. Record your results in the table above. [3]

(iii) Referring to the pH values you have recorded, describe any change in pH that occurs when yoghurt-milk mixture forms yoghurt.

.....[1]

(b) When making yoghurt, the milk is first heated to 85 °C and then allowed to cool to 45 °C.

(i) Suggest why the milk is heated to 85 °C.

.....

.....[1]

(ii) State how you could determine when the milk reaches a temperature of 85 °C.

.....

.....[1]

After the milk has been cooled to a temperature of 45 °C, a small volume of live yoghurt is added to it. This mixture is stirred and left at 45 °C for 8 hours. After this time, the milk has turned to yoghurt which can be cooled and eaten.

(iii) Using information in the table on page 2, suggest **two** ways you could check that the milk has been turned into yoghurt.

1 .....

.....

2 .....

.....
[2]

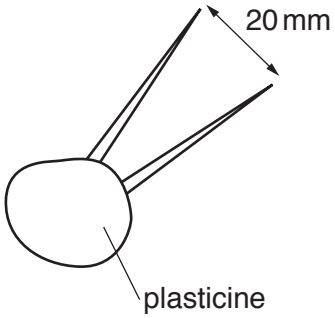
[Total: 11]

[Turn over

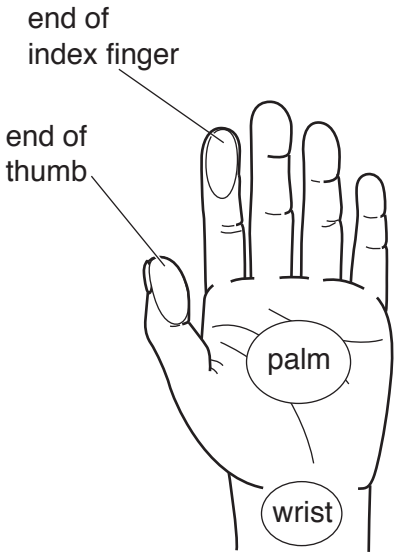
2 Human skin is a sense organ containing sensory receptors that can detect touch.

You are going to investigate the sensitivity of the skin of your hand to touch.
You are provided with a small ball of plasticine and two toothpicks.

- Carefully push one end of each toothpick into the plasticine and arrange them so that their other ends are 20 mm apart as shown in the diagram.



The areas you are going to test are shown in the diagram of the left hand below. If you are right-handed you can test your left hand; if you are left-handed you can test your right hand.



- Make sure the points are set at 20 mm apart.
- Gently touch the end of your index finger with the point of one toothpick.
- Gently touch the end of your index finger with two points at the same time.
- Do this several times to check whether you can feel the two separate points.

(a) (i) If you can feel the two separate points 20 mm apart on the end of your index finger, put a tick (✓) in the box in the table below. If you cannot feel two separate points put a cross (✗) in the box.

Keeping the points 20 mm apart, gently touch

- the end of your thumb with one point and then with both points. Record in the table whether you can feel two separate points (✓) or not (✗).
- your palm with one point and then with both points. Record in the table whether you can feel two separate points (✓) or not (✗).
- your wrist with one point and then with both points. Record in the table whether you can feel two separate points (✓) or not (✗).

Then adjust the toothpicks so that the points are 15 mm apart.

Repeat all these tests on the same parts of your hand and wrist as before and record your results in the table.

Repeat the tests with the two points 10 mm and then 5 mm apart. Record your results in the table.

	area tested			
distance between the two points/mm	**end of index finger**	**end of thumb**	**palm**	**wrist**
20				
15				
10				
5				

[4]

(ii) Using your results in the table, state which part of your hand is most sensitive.

.....[1]

[Turn over

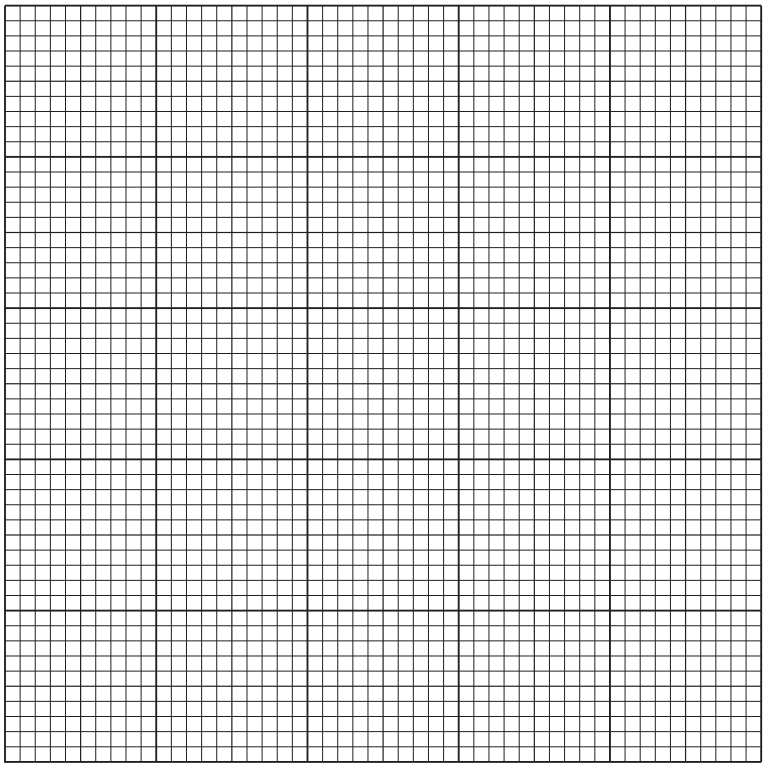
(b) Two students used the same method to test the sensitivity of the skin in other parts of the body. They recorded the minimum distance between the two points that could be sensed on the index finger, palm of the hand, forearm, upper arm and shoulder.

They worked together, with the student being tested closing their eyes while the other student touched parts of their skin and recorded whether two points were felt or not. They then changed places and the experiment was repeated on the second student.

They calculated their mean results which are shown in the table.

area of skin	mean minimum distance detected as two points/mm
index finger	2
palm	14
forearm (between wrist and elbow)	32
upper arm (between elbow and shoulder)	38
shoulder	42

(i) Construct a bar chart to display these results on the grid below.



[4]

(ii) Explain why the students tested each other and calculated a mean result.

.....

.....[1]

(iii) Suggest why the student being tested closed their eyes.

.....

.....[1]

(iv) Suggest **one** other variable that the students should control to ensure that their results are valid.

.....

.....[1]

(v) Suggest reasons for the different sensitivity of these areas of the skin.

.....

.....

.....

.....[2]

[Total: 14]

3 The photograph shows a developing fruit of a pea flower with half of the wall cut away.

×1.2

(a) (i) Make a large drawing of this developing fruit in the space below and label a seed and the pericarp (fruit wall).

[5]

(ii) Measure the distance between the lines labelled **A** and **B** on the photograph and record it.

..... mm

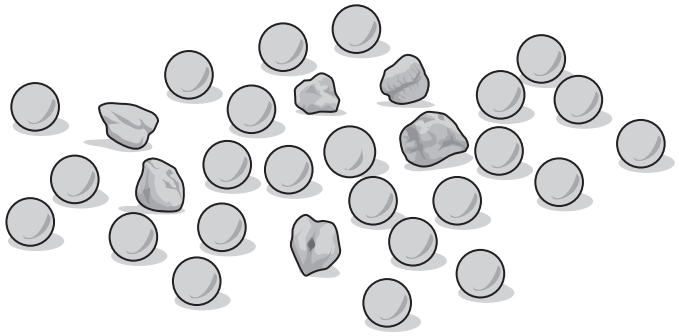
Calculate the length of the **actual** fruit in the photograph. Show your working.

.....[3]

(b) When pea seeds are fully formed they can be either round or wrinkled (with a rough surface).

In a genetics experiment, two pea plants grown from round seeds were cross-pollinated. The seeds from these plants were collected.

A random sample of these seeds is shown in the diagram.



(i) Count and record the number of round and wrinkled seeds.

round seeds .....

wrinkled seeds .....

[1]

(ii) Calculate the number of wrinkled seeds as a percentage of the total number of seeds shown. Show your working.

.....% [2]

(iii) A student states that this experiment should produce a ratio of 3 round seeds : 1 wrinkled seed. Comment on why the ratio obtained in the experiment differs from that predicted by the student.

.....

.....

.....

.....[2]

(c) Describe how you would test a pea seed to show that it contains protein.

.....

.....

.....[2]

[Total: 15]

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