

ADVANCED GCE**BIOLOGY**

Practical Examination 2 (Part B – Practical Test)

2806/03/TEST

Candidates answer on the question paper

OCR Supplied Materials:

- Insert (inserted)
- Slide **K1**

Other Materials Required:

- Candidate's Plan (Part A of the Practical Examination)
- Electronic calculator
- Ruler (cm/mm)

Tuesday 19 May 2009**Afternoon****Duration:** 1 hour 30 minutesCandidate
ForenameCandidate
Surname

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the spaces provided on the Answer Booklet.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read the instructions and each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- In this Practical Test, you will be assessed on the Experimental and Investigative Skills:
 - Skill I: Implementing
 - Skill A: Analysing evidence and drawing conclusions
 - Skill E: Evaluating.
- You may use an electronic calculator.
- You are advised to show all the steps in any calculations.
- This document consists of **11** printed pages and a Report Form. Any blank pages are indicated.

FOR EXAMINER'S USE

Qu.	Max.	Mark
Planning	16	
1	30	
2	14	
TOTAL	60	

Answer **all** the questions.

Question 1 [65 minutes]

Yeast cells are able to respire both aerobically and anaerobically. They can use a variety of respiratory substrates, including monosaccharides and disaccharides.

You are required to compare the rate at which yeast respire different sugars.

You are provided with six yeast suspensions in containers labelled **A** to **F**. Suspensions **A** to **E** each contain a different sugar. Suspension **F** has had only water added to it. These suspensions are listed below:

- **container A** yeast suspension and fructose
- **container B** yeast suspension and glucose
- **container C** yeast suspension and galactose
- **container D** yeast suspension and maltose
- **container E** yeast suspension and lactose
- **container F** yeast suspension and water

Fructose, glucose and galactose are monosaccharides; maltose and lactose are disaccharides.

The yeast suspensions have been prepared using sugar solutions of the same molar concentration and same volume.

You are also provided with a solution of triphenyltetrazolium chloride (TTC). This is a colourless solution that can be reduced to form a red compound.

Proceed as follows:

- 1** Stir yeast suspension **A** thoroughly using the glass rod.
Push the plunger all the way to the bottom of the syringe labelled **A**. Use the syringe to pull up 9 cm³ of yeast suspension **A**.
- 2** Remove the syringe from the yeast suspension **A** and pull the plunger up to the 10 cm³ mark to take up 1 cm³ of air into the syringe.
- 3** Attach one of the plastic tips to the nozzle of the syringe making sure it makes a tight fit. Point the syringe downwards over the container of yeast suspension **A** and push the plunger **gently** so that the liquid fills the plastic tip.

Place the syringe into one of the boiling tubes with the nozzle facing downwards as shown in Fig. 1.1.

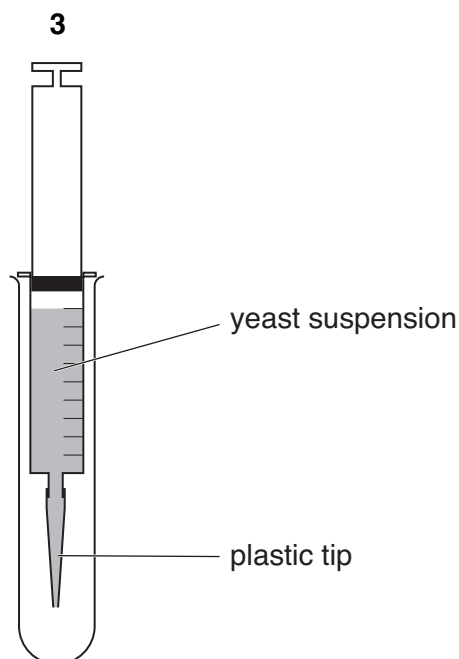


Fig. 1.1

Soon after you have set up the syringe, droplets may appear from the end of the plastic tip. However, continue with steps 4 and 5.

4 Repeat steps 1 to 3 with the syringes labelled **B** to **F** and the corresponding yeast suspensions.

5 Use the 5 cm³ syringe to add 2 cm³ of the TTC solution to each of the containers labelled **A** to **F**.

You will make observations from these containers for part (e) on page 6.

6 Determine the rate of droplet production by the yeast suspensions **A** to **F**. Record your results in a suitable format in the space provided on page 4.

7 When you have finished determining the rate of droplet production, record **one other** observation or measurement to compare rates of respiration. **Do not** record observations from the containers **A** to **F** to which you added TTC.

(a) Record your results in a suitable format in the space below.

(b) Explain what causes droplets of yeast suspension to emerge from the plastic tips of the syringes.

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(c) Describe the results you have recorded in **(a)**.

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(d) Explain the results that you have described in **(c)**.

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During respiration, hydrogen atoms are transferred to the hydrogen carrier NAD.

In this investigation, TTC acts as an artificial hydrogen acceptor.

- (e) Describe the appearance of the six suspensions in containers **A** to **F** to which you added TTC.

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- (f) Explain what happens during respiration within yeast cells to give the results you have recorded in (e).

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- (g) Explain how the results for the suspension in container **F** help you to explain the results obtained with the sugars in the other suspensions.

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- (h)** Discuss the limitations of the investigation that you have carried out. For each limitation, suggest appropriate improvements.

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[Total: 30]

Question 2 [25 minutes]

K1 is a stained section of the pancreas of a small mammal.

Fig. 2.1, **on the insert**, is a photomicrograph of part of the pancreas.

Search the whole of the pancreatic tissue in **K1** using the different lenses of your microscope.

- (a) State the names of regions **A**, **B** and **C**.

A

B

C

- (b) Use the high power of your microscope to study an area of slide **K1** similar to **region A** on Fig. 2.1 (on the insert).

Make a drawing to show how the cells in this region differ from those in the surrounding tissue.

Do **not** draw more than **five** cells from each area.

Annotate your drawing to indicate the differences between the cells in region **A** and those in the surrounding tissue.

QUESTION 2(c) STARTS ON PAGE 10

- (c) Outline the roles of the cells in region **A** in controlling the composition of the blood.

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[Total: 14]

END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE



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(a) Any particular difficulties encountered in making preparations for the Practical Test.

(b) Whether it was necessary to make any substitutions for the materials listed in the Instructions. Submit a copy of the results obtained by a teacher or technician, using the substituted materials, on top of the candidates' scripts.

(c) Any difficulties experienced by the candidate due to deficient materials or faulty apparatus. If so, give brief details.

(d) Any assistance given to the candidate with respect to colour blindness or other physical disability. If so, give brief details and attach a copy of the letter giving permission.

Other cases of hardship, for example illness, should be reported directly to OCR, by the Examinations Officer, using the Special Consideration form.

Signed

Information that applies to **all** candidates should be given on the first candidate's script **only** or supplied on a separate sheet placed on top of the candidate's scripts.