Class:



NAN CHIAU HIGH SCHOOL PRELIMINARY PRACTICAL ASSESSMENT 2021 SECONDARY FOUR EXPRESS

SCIENCE (BIOLOGY)

3 Aug 2021, Tuesday

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number in the spaces provided on the question paper. Write in dark blue or black pen. You may use a pencil for any diagrams or graphs. Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions If working is needed for any question it must be shown with the answer. Omission of essential working will result in loss of marks. Calculators should be used where appropriate.

The number of marks is given in brackets [] at the end of each question or part question. The total marks for this paper is 15.

You are advised to read the whole question before you start.

1(a) Yeasts are unicellular fungi that can survive both in the presence and absence of oxygen.

In the presence of oxygen, yeasts undergo aerobic respiration, breaking down carbohydrates into carbon dioxide and water.

In the absence of oxygen, yeasts undergo anaerobic respiration and break down carbohydrates into carbon dioxide and alcohol.

You are provided with glucose solution, and a suspension of yeast.

You will compare the metabolism of glucose in this species of yeast at two different temperatures.

Use the following method:

- Step 1 Label 2 test tubes **A** and **B**.
- Step 2 Using tap water and the hot water provided, prepare a beaker half-filled with water at room temperature, 30-32°C. The temperature of the water in the beaker should be maintained at this temperature throughout the experiment.
- Step 3 Using a spatula, gently stir the suspension of yeast in the beaker labelled 'yeast'. Add 4 cm³ of this yeast suspension to test tube **A** using a syringe.
- Step 4 Add 1 cm³ of glucose solution (labelled **G**) into test tubes **A** and gently shake the mixture.
- Step 5 Place test tubes **A** into the beaker of water at 35°C for 2 minutes.
- Step 6 During the 2-minute waiting time, prepare a test tube half-filled with water.
- Step 7 Connect the rubber bung and delivery tube to test tube **A** only, as shown below.
- Step 8 Submerge the open end of the delivery tube into the test tube of water.
- Step 9 Count the number of gas bubbles produced in the test tube of water in the next 2 minutes.



- Step 10 Draw a table in **1(a)(i)** to record the number of bubbles produced.
- Step 11 Remove the rubber bung and delivery tube from test tube **A**.
- Step 12 Prepare a water bath with the temperature of 70°C. The temperature should be maintained at 70°C throughout the experiment.
- Step 13 Gently stir the yeast suspension in the small beaker labelled 'yeast', and add 4 cm³ of the yeast suspension to test tube **B** using a syringe.
- Step 14 Add 1 cm³ of glucose solution (labelled **G**) into test tube **B** and gently shake the mixture.
- Step 15 Place test tube **B** into the beaker of hot water (70°C) and wait for 2 minutes.
- Step 16 Repeat steps 6 to 9 and record the results in the same table in 1(a)(i).
- (i) Record your results in a table in the space below, to show the number of bubbles produced by yeast at the two different temperatures. [3]

(ii) With reference to your results in **1(a)(i)**, describe and explain the difference in the number of gas bubbles released from **A** and **B** in the 2 minutes of counting.

 	 [3]

(iii) Counting number of bubbles is an inaccurate method of determining volume of gas produced. Suggest one change in the experimental set-up to record more accurate results.

.....[1]

(iv) Describe two ways in which your method of using the syringes ensured that the volume of mixture used were accurate.

(b) A fruit is the seed-bearing structure in flowering plants that is formed from the ovary after fertilisation.

The dish labelled **X** contains a slice of a fruit.

In the space below, draw a large, labelled diagram of the cut surface of the fruit. Include detailed structures and a magnification line to show the longest diameter of the fruit.

(ii) Calculate the magnification of your drawing. Show your working.

Magnification[2]

Total: [15]

End of Paper