National 5 Biology

Unit 1

Cell Biology

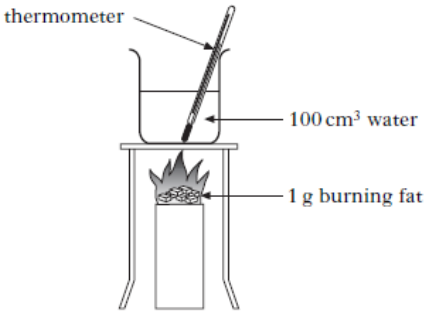
Ink Exercise Six

Respiration

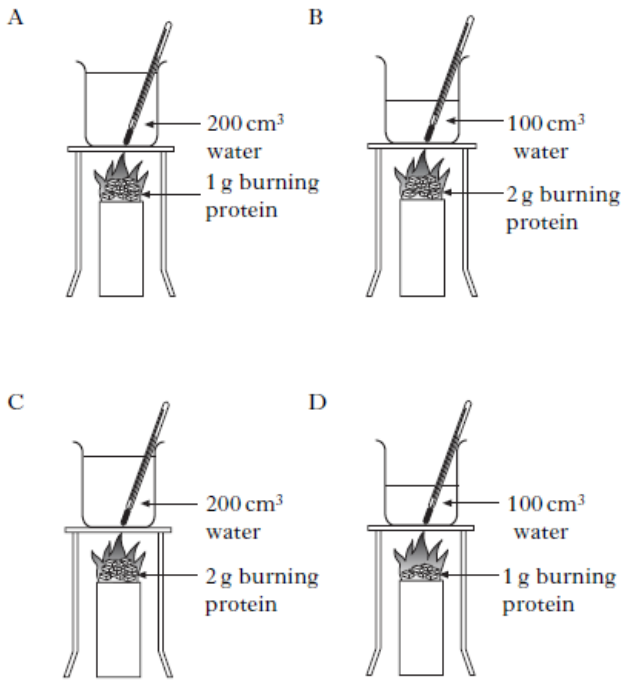
Name: _____

Class: _____

1. The diagram shows the apparatus used to investigate the energy content of fat.



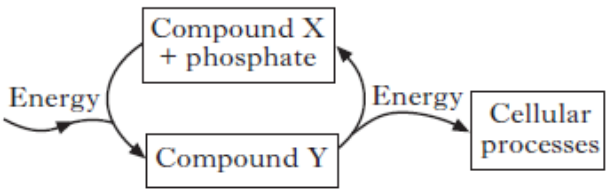
Which of the experiments shown bellow allows a valid comparison to be made between the energy content of fat and protein?



2. Which of the following shows the use of energy released from the breakdown of glucose?

   a. ATP + Pi → ADP
   b. ADP + Pi → ATP
   c. ATP → ADP + Pi
   d. ADP → ATP + Pi

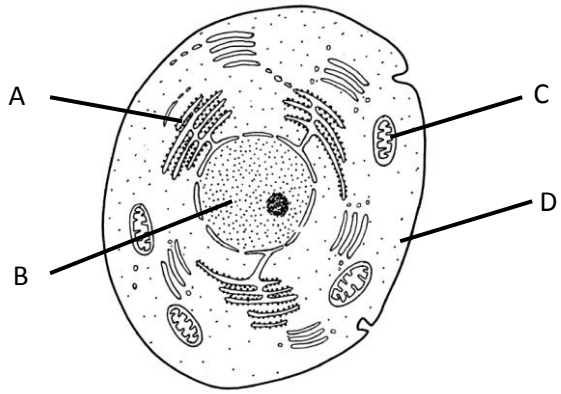
3. The diagram below shows energy transfer within a cell.



Which line of the table below identifies correct compound X and Y?

	X	Y
A	Glucose	ATP
B	Glucose	ADP
C	ADP	ATP
D	ATP	Glucose

Questions 4 and 5 refer to the diagram below



4. Which letter shows the site of glycolysis?

5. Which letter shows the site of aerobic respiration?

6. Which of the following statements is correct?
    a. Fermentation produces 38 molecules of ATP from each glucose molecule
    b. Fermentation produces twice as much energy as aerobic respiration
    c. Aerobic respiration produces 38 molecules of ATP from each glucose molecule
    d. Aerobic respiration produces 2 molecules of ATP from each glucose molecule

7. Which of the following is a reversible reaction of fermentation?
    a. The conversion of pyruvic acid to carbon dioxide and ethanol
    b. The conversion of glucose to pyruvic acid
    c. The conversion of pyruvic acid to carbon dioxide and water
    d. The conversion of pyruvic acid to lactic acid

8. How many more ATP molecules are produced per glucose molecule by aerobic respiration than fermentation?
    a. 2
    b. 19
    c. 36
    d. 38

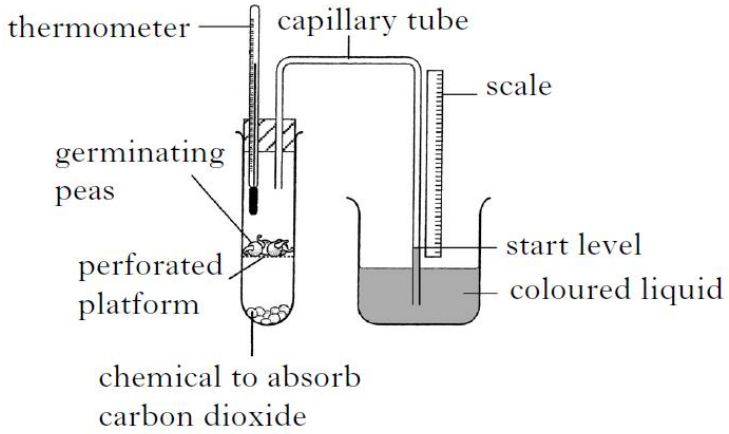
9. The following are statements about respiration.

    1 ATP is produced
    2 Lactic acid is produced
    3 Carbon dioxide is produced
    4 Ethanol is produced

Which of the statements are true of fermentation in human muscle tissue?

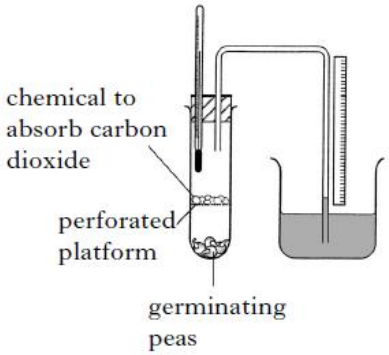
a. 2 only
b. 2 and 3 only
c. 1 and 2 only
d. 1, 3 and 4 only

10. The apparatus below was used to investigate respiration in germinating peas.

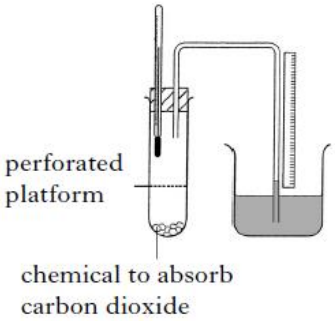


Which of the following would be a suitable control for this experiment?

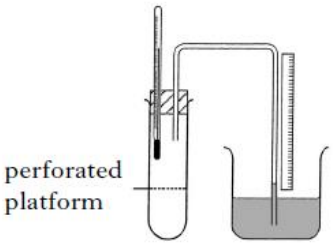
A



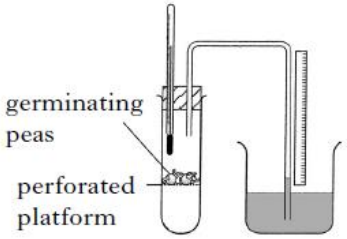
C



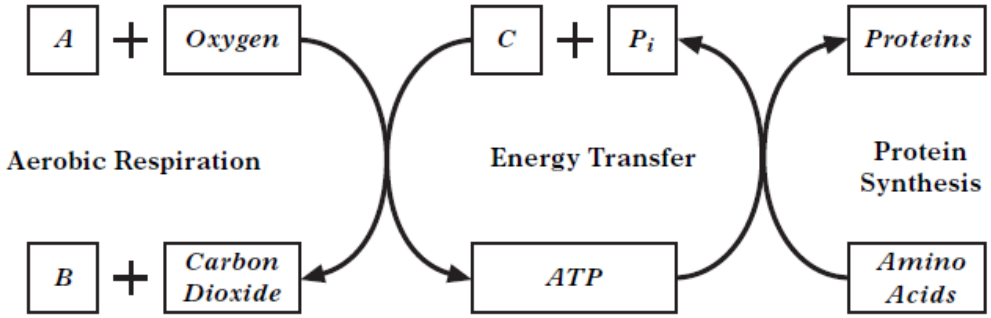
B



D



11. The diagram below shows the link between aerobic respiration and protein synthesis



a. Name substances A, B and C

A _____

B _____

C _____

2

b. Some energy released from respiration can be used for protein synthesis.

Name one other cellular activity that uses energy

_____

1

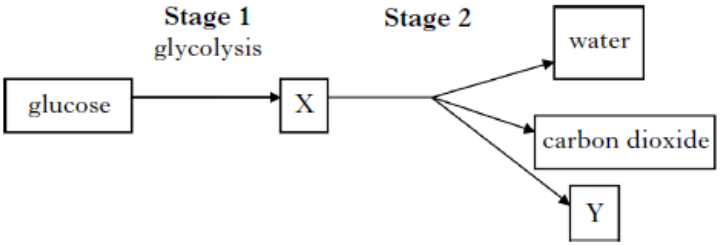
12. Yeast may carry out two different types of respiration.

a. Name the type of respiration which has the highest energy yield.

_____

1

b. The diagram below shows one type of respiration in yeast cells



i. Name substances X and Y

X _____

Y _____

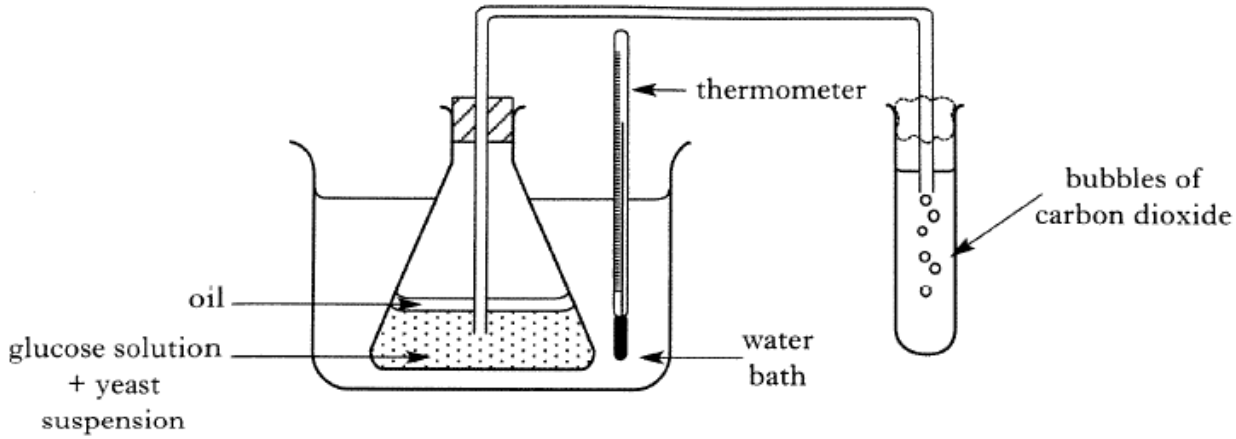
2

ii. What other substance must be present for stage 2 to occur?

_____

1

13. An investigation into the effect of temperature on fermentation in yeast was carried out



1 A glucose solution was boiled and cooled and poured into a conical flask

2 A yeast suspension was added to the glucose solution

3 Oil was poured over the surface of the liquid

4 The number of bubbles of carbon dioxide in one minute was counted

5 The procedure was repeated at a range of temperatures

a. In this investigation temperature was the only variable altered.
State two variables that should be kept constant when setting up the experiment

1 _____

2 _____

2

b. Explain the purpose of the layer of oil

_____

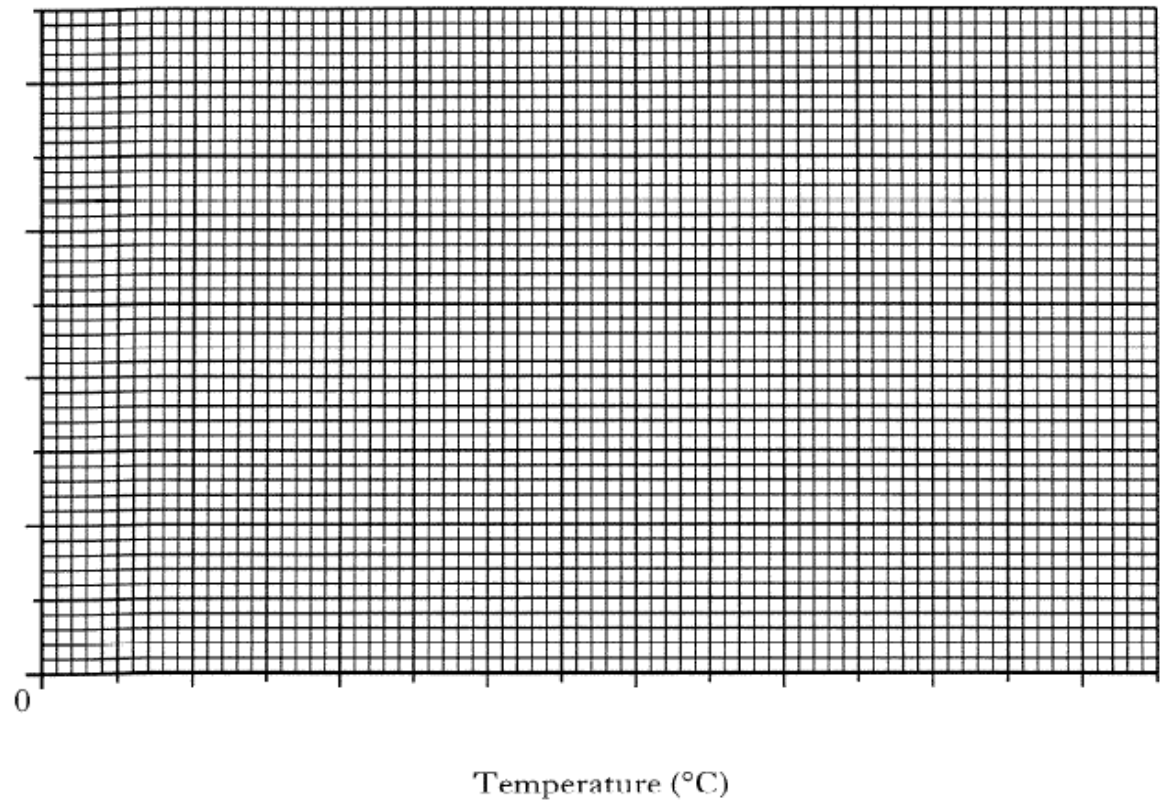
1

c. The results are shown in the table below

Temperature (^{o}C)	Bubbles of carbon dioxide (number/minute)
4	0
20	3
35	6
45	22
50	20
70	0

2

Present the results as line graph on the grid below



d. From the results, describe the effect of temperature on fermentation in yeast

_____

_____

2

e. In addition to carbon dioxide, what will be produced in the flask during the investigation?

_____

1

Areas I need to work on: