NAME: **CLASS:** **DATE:**

BIOLOGY REVISION

TOPIC: ENZYMES

Multiple Choice Questions:

1. Four tubes containing $10cm^3$ of 1% starch solution were treated in different ways and then mixed with saliva. After 30 minutes, $1cm^3$ of iodine in potassium iodide solution was added to each tube.

In which tubes were the contents a yellow-brown colour? [Nov 2008, Q3]

	Tube incubated at 35°C	Tube incubated at 75°C	Tube incubated at pH 2.5	Tube incubated at pH 6.9
A	✓		✓	
B	✓			✓
C		✓		✓
D		✓	✓	

Key

✓ = yellow-brown colour

2. According to the lock and key hypothesis, which is the lock and which is the key for the enzyme lipase? [Nov 2008, Q4]

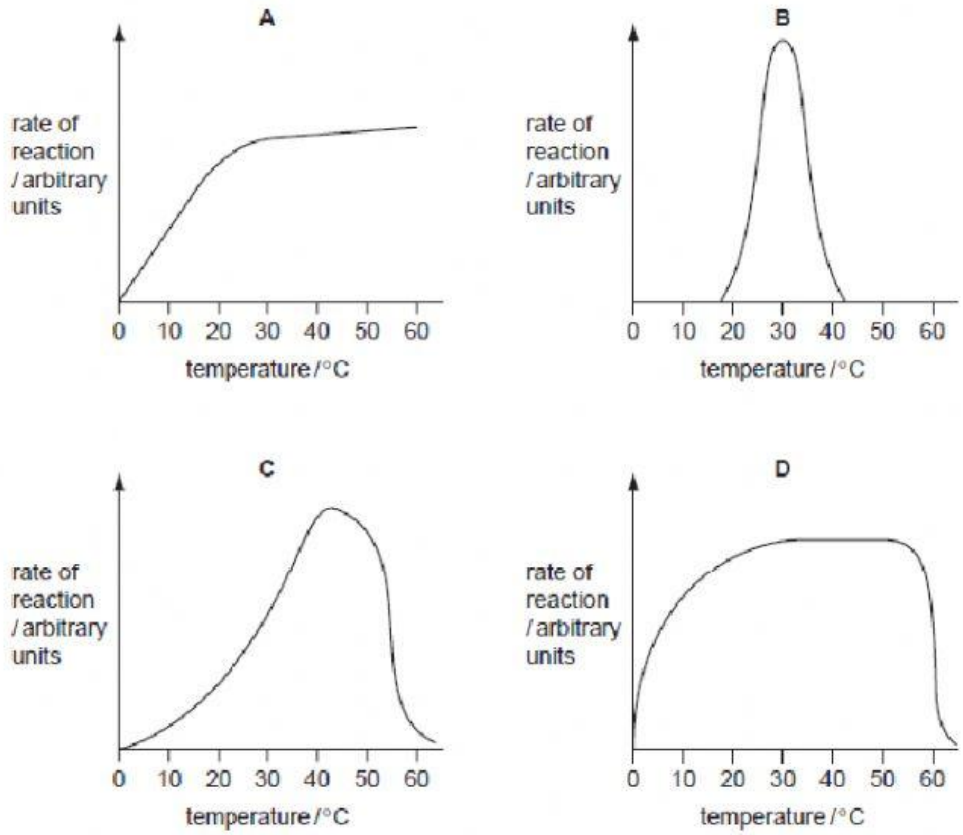
	Key	Lock
A	Fatty acids	Lipids
B	Lipase	Lipids
C	Lipase	Fatty acids
D	Lipids	Lipase

3. Protease breaks down proteins into amino acids. [Nov 2009, Q4]

In the 'lock and key' hypothesis, what is the lock and what is the key?

	Lock	Key
A	Amino acid	Protease
B	Protease	Amino acid
C	Protease	Protein
D	Protein	Protease

4. Which graph shows the effect of temperature on enzyme-controlled reactions? [Nov 2010, Q13]



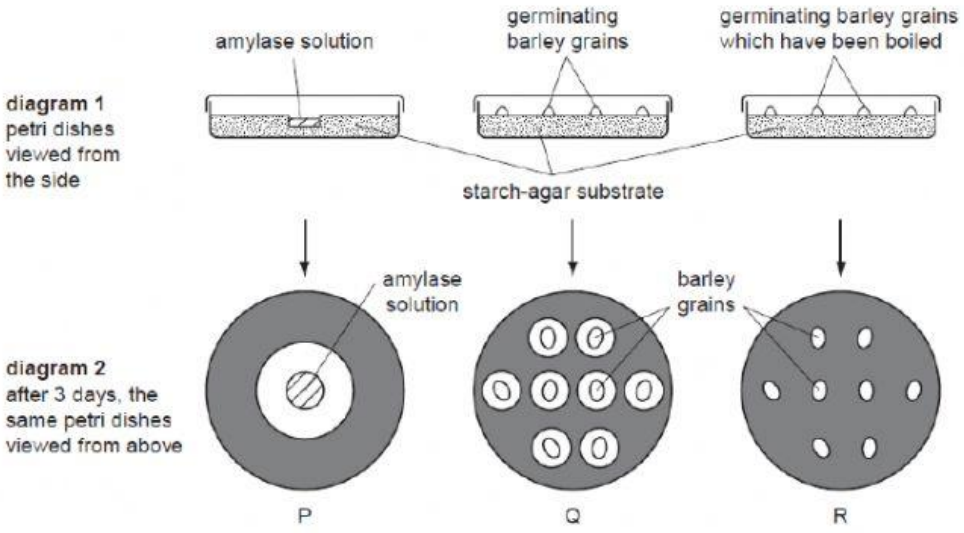
5. According to the lock and key hypothesis, which is the lock and which is the key for the enzyme lipase?
[Nov 2012, Q4]

	Key	Lock
A	Fatty acids	Lipids
B	Lipase	Lipids
C	Lipase	Fatty acids
D	Lipids	Lipase

6. In an enzyme action, where is the active site and where are the lock and the key? [Nov 2013, Q4]

	Active site	Key	Lock
A	On the enzyme	On the substrate	On the enzyme
B	On the enzyme	On the enzyme	On the substrate
C	On the substrate	On the enzyme	On the substrate
D	On the substrate	On the substrate	On the enzyme

7. In an experiment to investigate the **effects of heat** on germinating barley grains, three petri dishes were set up as shown in diagram 1 and left for 3 days. A solution of iodine in potassium iodide was then added to the starch-agar substrate. The results are shown in diagram 2, in which the shaded areas went blue/black, indicating the presence of starch.



Which is the **best** explanation of the results? [June 2008, Q3]

A Amylase is produced by barley grains that have been boiled

B Amylase from barley grains is denatured when they are boiled

C Germinating grains prevent iodine from staining starch blue/black

D Starch from the substrate is used by the grains as an energy source

8. Enzyme action can be explained by the lock and key hypothesis. [June 2008, Q4]

Where is the active site and which acts as the lock or key?

	active site	lock / key
A	On the enzyme	Substrate acts as a key
B	On the enzyme	Substrate acts as a lock
C	On the substrate	Enzyme acts as a key
D	On the substrate	Enzyme acts as a lock

9. Starch is digested to maltose by the enzyme amylase. [June 2012, Q4]

According to the 'lock and key' hypothesis, which is the 'key' and which is the 'lock'?

	'key'	'lock'
A	Amylase	Maltose
B	Amylase	Starch
C	Starch	Amylase
D	Starch	Maltose

10. Four test tubes, each containing 2 cm^3 of amylase solution are treated as follows: [June 2013, Q4]

1 boiled, then cooled to 1 °C

2 boiled, then cooled to 25 °C

3 frozen, then warmed to 1 °C

4 frozen, then warmed to 25 °C

10 cm^3 of starch solution were then added to each tube and after 5 minutes, 2 drops of iodine solution were added to each tube.

Which row shows the results?

	1	2	3	4
A	Black	Black	Black	Yellow
B	Black	Yellow	Black	Yellow
C	Yellow	Black	Yellow	Black
D	Yellow	Yellow	Yellow	Black

<u>Structured Questions:</u>

1. (a) Fig. 5.1 shows the effect of temperature on the activity of enzyme **E**. [June 2012, Q5]

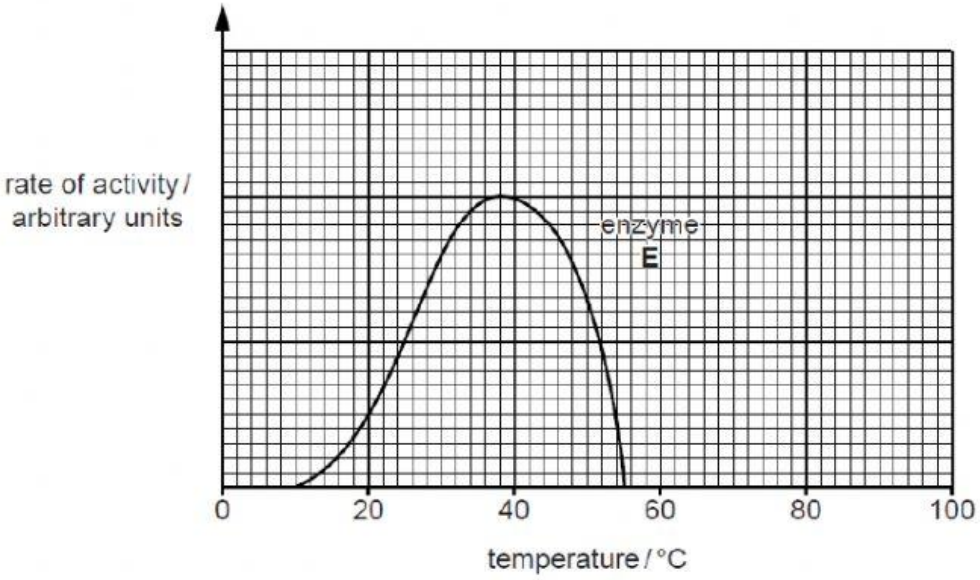


Fig. 5.1

(i) State the optimum temperature for enzyme **E** _____ [1]

(ii) Suggest a possible identity for enzyme **E**, where it is found, and its function.

identity of enzyme E _____

where it is found _____

function _____ [3]

(iii) State the temperature where enzyme **E** is denatured _____ [1]

(b) Fig. 5.2 shows the effect of temperature on the activity of another enzyme, F

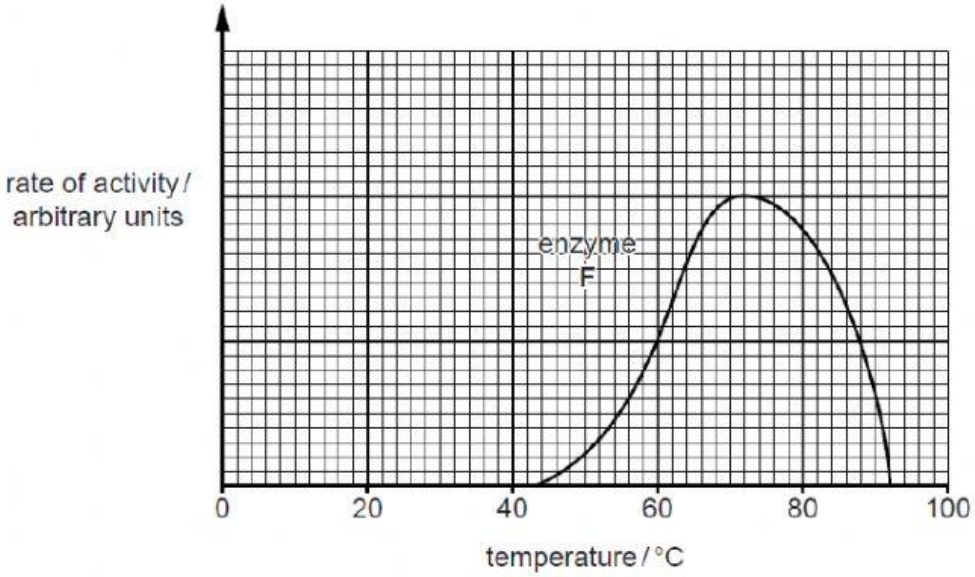


Fig. 5.2

State and explain what would happen to the activity of enzyme **E** at the optimum temperature for enzyme **F**.

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_____

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_____

_____ [5]

[Total: 10]

2. (a) Explain what is meant by the *lock and key* hypothesis for enzyme action. [Nov 2012, Q8]

[5]

(b) Describe how enzyme action is affected by an increase in temperature.

[5]

[Total: 10]