21. Biotechnology and genetic modification

21.2 Biotechnology

Paper 1 and 2

Question Paper

Paper 1

Questions are applicable for both core and extended candidates

1 What is a use of yeast in biotechnology?

A aerobic respiration to make biofuels

B anaerobic respiration to make bread

C aerobic respiration to make alcohol

D anaerobic respiration to make human proteins

2 What is a use of ethanol?

A biofuel production

B biological washing powder

C bread-making

D fruit juice production

3 The diagram shows a label found on a container of biological washing powder.

Which stains does the washing powder remove?

	food stain containing carbohydrates	food stain containing protein	food stain containing fat	food stain containing oil
A	✓	✓	✗	✗
B	✓	✗	✗	✓
C	✗	✓	✓	✓
D	✗	✗	✓	✗

key
✓ = yes
✗ = no

4 Biological washing powders can remove stains from clothes.

What must a washing powder contain, to remove an oil stain from a t-shirt?

A amylase

B lipase

C pectinase

D protease

5 Which row shows what is used to make biofuel, bread and fruit juice?

	biofuel	bread	fruit juice
A	pectinase	pectinase	yeast
B	pectinase	yeast	pectinase
C	yeast	pectinase	yeast
D	yeast	yeast	pectinase

6 What is the useful product of anaerobic respiration in the manufacture of bread?

A carbon dioxide

B ethanol

C lactic acid

D oxygen

7 What is a use of pectinase in the food industry?

A to extract juice from fruit

B to make biofuels

C to make biological washing powders

D to make bread rise

8 Yeast carries out anaerobic respiration, making carbon dioxide and ethanol as end products.

Which end products can be used to make biofuel and bread?

	biofuel	bread
A	carbon dioxide	carbon dioxide
B	carbon dioxide	ethanol
C	ethanol	carbon dioxide
D	ethanol	ethanol

9 What is the role of anaerobic respiration in bread-making?

A to produce alcohol to flavour the bread

B to produce gas to make the bread rise

C to release enough energy to bake the bread

D to release enough lactic acid to kill the yeast

10 Which feature of bacteria makes them especially useful in biotechnology?

A They are often pathogens.

B They have a unique genetic code.

C They have cell walls.

D They reproduce rapidly.

11 Biotechnology is used to produce ethanol for biofuels.

Which type of organism can be used to produce the ethanol?

A fish

B myriapods

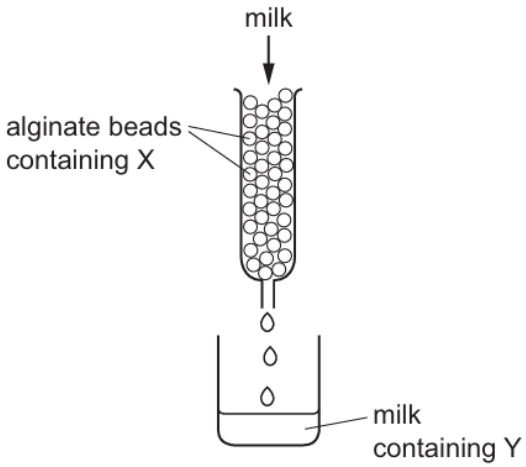
C viruses

D yeast

Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

12 The diagram shows some apparatus that was used to produce lactose-free milk.



The alginate beads do not react with any of the substances. X is an enzyme that catalyses a reaction involving one of the substances found in milk.

What are X and Y? **(extended only)**

	X	Y
A	amylase	glucose
B	amylase	starch
C	lactase	glucose
D	lactase	starch

13 Which product is made using an enzyme rather than bacteria or fungi? **(extended only)**

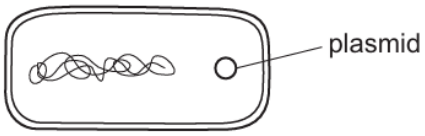
A insulin

B penicillin

C lactose-free milk

D mycoprotein

14 The diagram shows a bacterial cell containing a plasmid.



What is inserted into the plasmid if this cell is to be used for the production of insulin?

A a length of DNA from a human

B a length of DNA from another bacterium

C a molecule of insulin

D an enzyme

15 What is the useful product of anaerobic respiration in the manufacture of bread?

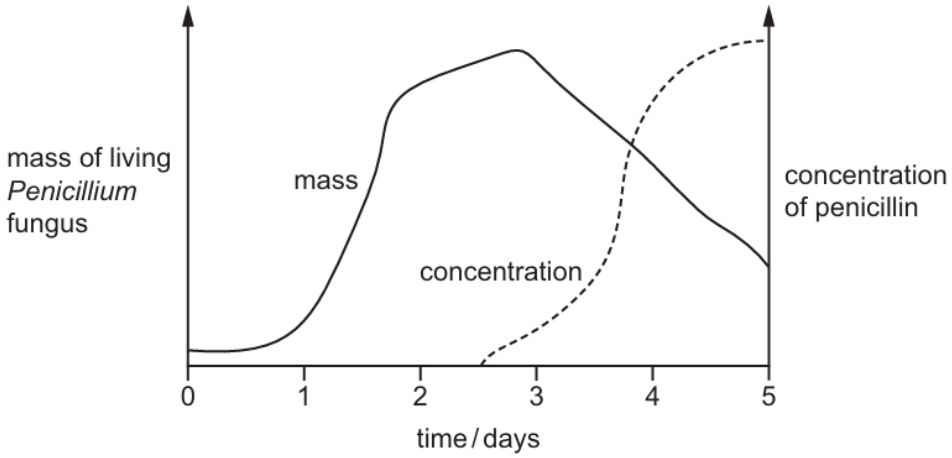
A carbon dioxide

B ethanol

C lactic acid

D oxygen

16 Penicillin is produced in a fermenter by growing the fungus *Penicillium*. The graph shows how the mass of living *Penicillium* fungus and the concentration of penicillin changed over time.



When is the best time to collect the penicillin? **(extended only)**

A at 1.5 days

B at 3 days

C at 3.5 days

D at 5 days

17 What is the role of anaerobic respiration in bread-making?

A to produce alcohol to flavour the bread

B to produce gas to make the bread rise

C to release enough energy to bake the bread

D to release enough lactic acid to kill the yeast