AQA A-LEVEL · 7402

BIOLOGY



EXAM QUESTION PACK

3.8.3 GENOME PROJECTS AND SEQUENCING

SCORE	PERCENTAGE
/34	%

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Q1.

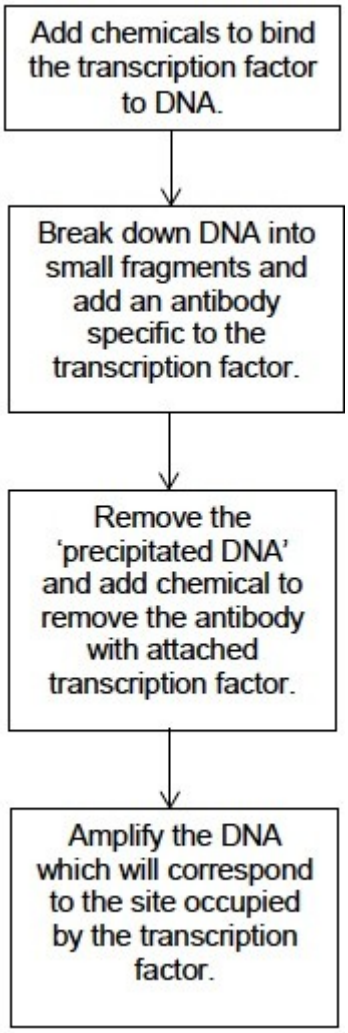
(a) What is meant by a genome?

_____

_____

(1)

Chromatin immunoprecipitation is one method to determine where a transcription factor binds to DNA. The principle behind this procedure is shown in the chart.



(b) Explain why the antibody binds to the transcription factor.

_____

_____

_____

_____

_____

_____

(2)

(c) Use the chart to explain what 'precipitated DNA' consists of.

_____

_____

(1)

Soybeans are used in a number of processed foods. However, soybeans contain a protein known as P34 that causes an allergic response in some people. Scientists have created transgenic soybeans that produce single-stranded cDNA, which prevents transcription of the *P34* gene. They used recombinant plasmids as vectors to transform soybean cells. After they had screened these cells for production of the P34 protein, they cultured the transformed cells to form soybean plants.

(d) Suggest how single-stranded cDNA could prevent transcription of the *P34* gene.

_____

_____

_____

_____

(1)

(e) Describe the roles of **two** named types of enzymes used to insert DNA fragments into plasmids.

Type of enzyme _____

Role _____

_____

_____

_____

Type of enzyme _____

Role _____

_____

_____

_____

(2)

(f) The soybean cells were screened for the presence of the P34 protein. This process involved the use of gel electrophoresis to separate proteins extracted from soybean cells.

Suggest **two** features of the structure of different proteins that enable them to be separated by gel electrophoresis.

1. _____

_____

_____

2. _____

_____

_____

(2)

(Total 9 marks)

Q2.

Write an essay on using DNA in science and technology.

(Total 25 marks)