Past HKCEE Questions
Genetic Engineering
Paper I

1. Long ago, scientists discovered that a certain kind of soil bacteria can produce a protein that is toxic to insects. The scientists intended to transfer the gene coding for this protein to crop plants, so as to reduce the damage of crops by insects. In 1995, the US first developed such a genetically modified (GM) corn plant containing this gene. The flowchart below outlines the development of the GM corn plant:

(a) Name the type of cell division that is involved in step 3. State the significance of this type of cell division in the production of the GM corn plants. (2 marks)

(b) Discuss briefly *one* consequence of cultivating this GM corn plant in the field to the surrounding ecological community. (2 marks)

(c) To improve the quality of food produced, state another character of cultivated plants that scientists would modify besides the insect-resistant character. Give an advantage of this genetic modification. (2 marks)

Past HKCEE Questions
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Paper II

07-35
A genetically modified rice is being developed so as to increase its harvest. This can be achieved by the insertion of a gene that can produce

A. vitamin A.
B. a human protein.
C. a toxin to kill pests.
D. a substance to lengthen the shelf life.

Past HKCEE Questions
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Suggested Answers

Paper I

1. (a) * Mitotic cell division
This ensures that all the GM corn plants produced carry the inserted gene / are genetically identical

(b) (any 1 set below (1+1)) 2
It may kill some other insects / lead to a drop in the insect population thus resulting in the extinction of the species / reduction of biodiversity
or
It may kill some beneficial insects which may help the pollination of other plants
or
If the corn grains are dispersed into the natural environment, the plants formed will outcompete / displace some other species due to its resistance to insects (accept other reasonable answers)

(c) (any 1 set below (1+1)) 2
Increase the ability of producing vitamins, e.g. vitamin A to increase the nutritive value of the food produced
or
Increase the ability to fix nitrogen / nitrogen fixation
to increase protein content of the food produced
(accept other reasonable answers)

Paper II

07-35	C