1. Microbes are useful in biotechnology because they:

   ☐ never make useful products

   ☐ are large animals

   ☐ cannot be controlled

   ☐ reproduce very fast and are easy to grow

2. What did Fleming notice in 1928?

   ☐ Insulin crystals had formed

   ☐ Yeast had made bread rise

   ☐ A seed bank had frozen

   ☐ Bacteria had died around a mould

3. A fermenter is used to:

   ☐ kill all the microbes in a product

   ☐ grow microbes in large amounts under controlled conditions

   ☐ store the finished medicine safely

   ☐ filter water before it is used

4. In genetic modification, a useful gene is cut out using:

   ☐ heat only

   ☐ water

   ☐ a microscope

   ☐ enzymes

5. Genetic modification involves:

   ☐ breeding the best parents

   ☐ cloning by mitosis

   ☐ inserting a gene from one organism into another

   ☐ removing all genes

6. Which are controlled in a fermenter?

   ☐ Temperature

   ☐ pH

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   ☐ The colour of the tank

   Tick every correct option.

7. Which conditions are controlled in a fermenter? (Select all that apply.)

   ☐ pH

   ☐ temperature

   ☐ the colour of the tank

   ☐ oxygen supply

   Tick every correct option.

8. GM crops can be made to be: (Select all that apply.)

   ☐ unable to grow

   ☐ richer in vitamins

   ☐ higher-yielding

   ☐ pest-resistant

   Tick every correct option.

9. Genetic modification raises ethical and environmental concerns as well as offering benefits.

   ☐ True ☐ False

10. Fermenters are kept sterile so other microbes do not compete or contaminate.

    ☐ True ☐ False

1. **reproduce very fast and are easy to grow**

   Fast reproduction and easy growth make microbes ideal.

2. **Bacteria had died around a mould**

   The mould made penicillin.

3. **grow microbes in large amounts under controlled conditions**

   Fermenters culture microbes to make products.

4. **enzymes**

   Enzymes cut the gene from the DNA.

5. **inserting a gene from one organism into another**

   GM transfers a gene between organisms.

6. **Temperature; pH; Oxygen supply**

   Also nutrients and sterility.

7. **pH; temperature; oxygen supply**

   Temperature, pH and oxygen matter; tank colour does not.

8. **richer in vitamins; higher-yielding; pest-resistant**

   GM improves crops; it would not make them unable to grow.

9. **True**

   Both benefits and concerns must be weighed.

10. **True**

    Pure product.

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