

A-Level Biology

Name: _____ Score: _____

1. Recombinant DNA is:
 - ☐ DNA made by joining together DNA from two different sources
 - ☐ DNA from a single organism only
 - ☐ a type of protein
 - ☐ a damaged chromosome
2. The polymerase chain reaction (PCR) is used to:
 - ☐ amplify DNA, making millions of copies
 - ☐ cut DNA into fragments
 - ☐ separate DNA by length
 - ☐ join two genes
3. Genetically modified bacteria can be used to make human insulin.
 - ☐ True ☐ False
4. An organism whose genes have been deliberately changed, often with a gene from another species, is a genetically _____ organism.

5. Recombinant DNA is made by joining DNA from two different sources (e.g. a human gene into a bacterial plasmid).
 - ☐ True ☐ False
6. The technique that makes millions of copies of a DNA sample is the _____ chain reaction.

7. An advantage of making insulin as a recombinant human protein is that it:
 - ☐ is an exact human copy, safer and never in short supply
 - ☐ must be taken from animals
 - ☐ cannot be made in large amounts
 - ☐ works less well than animal insulin
8. Insect-resistant GM cotton works because it:
 - ☐ makes a protein that kills the insect pests
 - ☐ grows faster

☐ is resistant to a herbicide

☐ needs no water

9. Reverse transcriptase is used to:

☐ make DNA from an mRNA template

☐ cut DNA at a specific sequence

☐ join two DNA pieces

☐ copy DNA directly

10. Human insulin made by genetically modified bacteria is described as _____ insulin.

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1. DNA made by joining together DNA from two different sources

Recombinant DNA combines DNA from two sources — e.g. a human gene joined into a bacterial plasmid.

2. amplify DNA, making millions of copies

PCR amplifies DNA through repeated heat/cool cycles using Taq polymerase.

3. True

The human insulin gene is inserted into the bacteria, which then make exact human insulin.

4. modified

A GMO carries a gene added by genetic engineering.

5. True

Because the genetic code is universal, a human gene works inside a bacterium that takes it up.

6. polymerase

PCR (the polymerase chain reaction) uses Taq polymerase to copy DNA over many cycles.

7. is an exact human copy, safer and never in short supply

Recombinant insulin is identical to human insulin, available in quantity, and avoids animal/donor sources.

8. makes a protein that kills the insect pests

The engineered cotton produces a protein toxic to insect pests, protecting the crop.

9. make DNA from an mRNA template

Reverse transcriptase builds a DNA copy from mRNA — one way of obtaining the gene to transfer.

10. recombinant

Recombinant = the human gene has been combined into the bacterium's DNA.